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TWENTY-SECOND BIENNIAL REPORT
OF THE
NORTH CAROLINA
STATE BOARD OF HEALTH

JULY 1, 1926 - JUNE 30, 1928

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TWENTY-SECOND BIENNIAL REPORT

OF THE

NORTH CAROLINA

STATE BOARD OF HEALTH



JULY 1, 1926 - JUNE 30, 1928

Members of the State Board of Health

Elected by the North Carolina Medical Society

CYRUS THOMPSON, M.D.
Term Expires 1931

D. A. STANTON, M.D.
Term Expires 1931

L. E. McDANIEL, M.D.
Term Expires 1935

THOMAS E. ANDERSON, M.D.
Term Expires 1935

Appointed by the Governor

JOHN B. WRIGHT, M.D.
Term Expires 1931

E. J. TUCKER, D.D.S.
Term Expires 1931

JAMES P. STOWE, Ph.G.
Term Expires 1933

CHAS. C. ORR, M.D.
Term Expires 1935

A. J. CROWELL, M.D.
Term Expires 1935

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Letter of Transmittal

RALEIGH, N. C., December 1, 1928.

*His Excellency, A. W. McLEAN,
Governor of North Carolina.*

MY DEAR SIR:—Under authority of chapter 118, Article 1, section 7050, Consolidated Statutes of North Carolina, I have the honor to submit the Biennial Report of the State Board of Health for the period July 1, 1926, to June 30, 1928.

Very respectfully yours,

CHAS. O'H. LAUGHINGHOUSE,
Secretary and Treasurer.

Public Health Work in North Carolina

In the seventies Dr. Thomas Fanning Wood, of Wilmington, caught the vision of the possibilities of public health work to North Carolina. How fully he grasped the far-reaching consequences of his idea, how clearly he saw the ever-growing hosts of lives saved as a result of his vision and inspiration, we shall never know. We do know that the vision never left him, and that under its sway he worked, through the Medical Journal which he edited and through the North Carolina State Medical Society, until his influence reached the people of the State in their General Assembly of 1877, with the effect that on February 12, 1877, the North Carolina State Board of Health was born. Ours was the twelfth State board of health to be established.

Without treating the development of the newly-established board with that thoroughness that could be termed history, we think it enough to set down here in chronological order the principal events in the life and growth of the North Carolina State Board of Health.

1877. Board created. Consisted in the beginning of entire State Medical Society. Society acted through a committee. Annual appropriation, \$100.
1878. First educational pamphlet issued. Subject, "Timely Aid for the Drowned and Suffocated." Annual appropriation, \$100.
1879. The General Assembly reconstituted the Board of Health. Made it to consist of nine members: six appointed by the Governor, three elected by the State Medical Society. Term of office, five years. Dr. Thomas F. Wood elected first Secretary of the Board, May 21. Other legislative provisions: (1) Chemical examination of water, and (2) organization of county boards of health, composed of all regular practicing physicians and, in addition, the mayor of the county town, the chairman of the board of county commissioners, and the county surveyor. Four educational pamphlets issued. Subjects: "Disinfection, Drainage, Drinking-water, and Disinfectants;" "Sanitary Engineering;" "Methods of Performing Post-mortem Examinations;" "Limitation and Prevention of Diphtheria." Annual appropriation, \$200.
1881. General Assembly passed a law requiring registration of vital statistics at annual tax listing; law ineffective. Annual appropriation, \$200.
1885. General Assembly made county boards of health more efficient; allowed printing privileges not to exceed \$250 annually. Annual appropriation, \$2,000.
1886. Bulletin made its appearance in April. Pamphlet on "Care Eyes and Ears," by Dr. Richard H. Lewis, printed and distributed. Subsequent Legislature provided for extra edition of 10,000 copies for general distribution. Annual appropriation, \$2,000.
1888. Yellow fever epidemic in Florida and refugees to Western North Carolina demonstrated value of a Board of Health to cope with situation. Annual appropriation, \$2,000.

1892. Dr. Thomas F. Wood, the Secretary of the Board, died August 22. Dr. Richard H. Lewis elected Secretary to succeed Dr. Thomas F. Wood, September 7. Annual appropriation, \$2,000.
1893. Legislative provisions: (1) Laws improving the reporting of contagious diseases, (2) the protection of school children from epidemics, (3) protecting the purity of public water supplies, and (4) regulation of common carriers. Legislature provided that Governor appoint five of the nine members of the Board of Health, that the State Medical Society elect four, and that the term of office of the members of the State Board of Health be reduced from five to two years. The \$250 printing limit was removed. Pamphlet on quarantine and disinfection was prepared and reprinted by many of the State papers. Annual appropriation, \$2,000.
1894. A number of public health conferences were arranged and held in different towns of the State. Bulletin was increased from a mailing list of 800 to 1,200. Annual appropriation, \$2,000.
1895. Dr. Albert Anderson and Dr. W. T. Pate were elected bacteriologists for the board. Annual appropriation, \$2,000.
1896. Board passed a resolution requiring chemical and bacteriological examinations of municipal water supplies. Dr. Venable of Chapel Hill, undertook the chemical examination, and Drs. Anderson and Pate the bacteriological examination. Board also directed Mr. John C. Chase, the engineer member, to inspect all municipal water plants in the State. Annual appropriation, \$2,000.
1897. General Assembly enacted law requiring county superintendents of health to be elected by county commissioners, and reduced term of office to one year. Annual appropriation, \$2,000.
1899. General Assembly improved the laws protecting public water supplies. Smallpox prevailed extensively in the State. Dr. Henry F. Long, and later, on Dr. Long's resignation, Dr. Joshua Tayloe were employed to travel over the State, consulting with and advising the local sanitary authorities as to proper means for protecting the public. Annual appropriation, \$2,000.
1900. State Board of Agriculture, on request of State Board of Health, agreed to examine samples of water from public water supplies until Board of Health could provide its own examiner. Annual appropriation, \$2,000.
1901. State Board of Embalmers, with representatives of State Board of Health, established. County health work placed in the hands of county sanitary committees composed of county commissioners and two physicians which commissioners elected to serve with them. Term of office of county superintendent of health made two years. Annual appropriation, \$2,000.
1903. General Assembly enacted law permitting Board of Health to charge \$5 for each analysis of a public water supply, this fee to be used in paying Department of Agriculture for services of examiner. Dr. C. W. Stiles, U. S. P. H. S., before the State Medical Society at Hot Springs, called attention to prevalence of hookworm dis-

ease in the South. Dr. J. L. Nicholson and Dr. W. S. Rankin, working under State Board of Health during fall of 1903 and spring of 1904, showed great prevalence of this disease in North Carolina. Annual appropriation, \$2,000.

1904. A stenographer was employed. One hundred and twenty thousand pamphlets on tuberculosis were printed and distributed. There was a renewal and an extension of coöperative work between the Board of Health and the State press, a number of articles dealing with hygienic and sanitary subjects being furnished the papers and published in them. Annual appropriation, \$2,000.
1905. General Assembly established State Laboratory of Hygiene; imposed water tax of \$64 on all public water companies; voted \$600 annually for support of Laboratory. Small appropriation made it necessary for the Department of Agriculture to continue to assist State Board of Health. Annual appropriation, \$2,600.
1906. The North Carolina Association for the Study and Prevention of Tuberculosis was organized. Annual appropriation, \$2,600.
1907. Two thousand dollars appropriated for the State Laboratory of Hygiene. Pasteur treatment provided. State Sanatorium for treatment of tuberculosis founded: \$15,000 appropriated for permanent improvements and \$5,000 for maintenance. A law requiring the separation of tuberculous prisoners from other prisoners was enacted. Annual appropriation, \$4,000.
1908. January 1, Dr. C. A. Shore became Director of State Laboratory of Hygiene. Annual appropriation, \$4,000.
1909. General Assembly provided for (1) whole-time State Health Officer; (2) collection of vital statistics of towns having a population of 1,000 or over; (3) that all public water companies file plans and specifications of their plants with the State Board of Health, and that the State Board of Health pass necessary rules and regulations for the care of public watersheds and plants and furnish such rules and regulations and other advice to those having charge of public water supplies; (4) that counties provide free diphtheria antitoxin for county indigents, and (5) that the maintenance appropriation for the Sanatorium be increased from \$5,000 to \$7,500, and an additional \$30,000 be granted for permanent improvements. Dr. Richard H. Lewis resigned as Secretary of the Board, and Dr. W. S. Rankin was elected as his successor, beginning his official work July 1. Annual appropriation, \$10,500.
1910. General effort to interest the people and State organizations in public health work. Bulletin increased from 3,500 edition to 10,500 edition. Addresses on public health work delivered to Conference of County Superintendents of Schools, State Federation of Women's Clubs, State Press Association, and Sanitary Sunday observed in April. Dr. John A. Ferrell elected, February, Assistant Secretary for Hookworm Eradication; began work under State Board of Health and Rockefeller Sanitary Commission. First effort in the eradication of hookworm disease was to interest school teachers in the disease and through their assistance examine and treat the children, and thereby reach the community.

Three bottled spring waters sold on the market examined, found polluted, and public attention called to the pollution. Annual appropriation, \$10,500.

1911. Legislature established county boards of health to take the place of the county sanitary committees; county board of health composed of chairman board of county commissioners, county superintendent of schools, mayor of county town, and two physicians selected by the three county officials to serve with them. Legislature also abolished quarantine for smallpox and improved the quarantine laws. One thousand dollars annually appropriated to contract with antitoxin manufacturers for State supply of high-grade diphtheria antitoxin, with result that price of antitoxin was cut to one-fourth former price, saving the citizens of the State over \$30,000 annually. Bulletin increased from 11,500 copies to 20,000 copies each edition; closer coöperation with press of State developed; regular weekly press articles prepared and sent to papers; increase in numbers of popular pamphlets for distribution. Hookworm work this year largely educational through the school forces and investigative through county dispensaries; thousands of children found infected and treated. Strong sentiment began to make itself felt for better health work by counties, four counties employing whole-time county health officers. Maintenance appropriation for State Sanatorium increased to \$12,500, with \$20,000 voted for permanent improvements. Annual appropriation, \$22,500.
1912. Bulletin increased to 40,000 edition; number of popular pamphlets dealing with different diseases increased; press work improved; educational work of Board along all lines amplified. Secretary of Board of Health called attention of conjoint meeting of State Medical Society and State Board of Health to the relative importance of health problems and the bearing of this subject upon the proper apportionment of health funds; instrumental in passing a resolution to the effect that pellagra was an interstate problem, not a State problem, and requesting the Federal Government to deal with pellagra as a Federal problem; resolution responsible, to considerable extent, for successful effort on part of Hon. John M. Faison's securing Congressional appropriation of \$45,000 for the study of pellagra by the Federal Government. Hookworm work extended and county funds appropriated to supplement State and Rockefeller Foundation for this work. Annual appropriation, \$22,500.
1913. General Assembly passed Model Vital Statistics Law with \$10,000 appropriation for its enforcement. County superintendents of health changed to either county physician or county health officer. Educational efforts of Board continued and enlarged. Hookworm work along same line as year before increased in amount. Dr. John A. Ferrell resigned as Assistant Secretary to accept position with the central office of the Rockefeller Sanitary Commission in Washington, D. C. Dr. C. L. Pridgen succeeded Dr. Ferrell. The movement for improved county health work had by this time resulted in ten counties electing whole-time county health officers.

The State Sanatorium for Treatment of Tuberculosis turned over by Extra Session of 1913 to the management of State Board of Health. Annual appropriation, \$40,500.

1914. Preceding work of the Board continued. Board of Health took over management of Sanatorium; started out under many difficulties on account of the institution owing many debts and the appropriation being limited. Hookworm work changed to community work directed to the installation of sanitary privies in all homes. Laboratory began to produce and distribute free anti-typhoid vaccine. Dr. C. L. Pridgen resigned as Director Hookworm Eradication, and Dr. W. P. Jacocks succeeded him. Annual appropriation, \$40,500.
1915. General Assembly makes State vital statistics law conform to National model by requiring burial permits in rural communities; enacts legislation permitting county commissioners and towns and cities to appropriate money for support of tuberculous citizens in State Sanatorium; provides \$15,000 for purchase and building of antitoxin plant; appropriates \$60,000 for payment of Sanatorium debts and new buildings and other improvements, and \$25,000 annually for maintenance and \$10,000 for extension anti-tuberculosis work. Educational work greatly extended: Bulletin now 47,000; traveling public health exhibit shown at fairs and other assemblages; press work greatly developed through employment of journalist for whole time; stock lectures with lantern slides supplied public speakers in different parts of the State; community soil pollution work under Dr. W. P. Jacocks stops in May, and Bureau of County Health Work with Dr. G. M. Cooper at its head, succeeds, beginning work in June. Considerable amount of work done for improvement of prison conditions. The unit system of county health work gets a good start: over 52,000 people given three complete vaccinations against typhoid fever, and medical inspection of schools put on in one county. Annual appropriation, \$50,500.
1916. North Carolina was admitted to the Registration Area for deaths. To the educational agencies of the Board was added a self-supporting moving picture health show. Many saw this show during the year, and, seeing, believed in health work as never before. Bulletin had to be discontinued temporarily for lack of printing funds, but before discontinuance reached 51,000 edition. Co-operation with University in developing a plan and putting on a home post-graduate course in medicine, giving first course to 169 doctors. Put into operation an optional system of hotel inspection, with grading and publishing scores. Continued unit system of county health work, giving three anti-typhoid injections to 48,000, making 100,000 immunized in summers of 1915 and 1916. Did complete medical inspection of five counties and with inspection a large amount of educational work as to sanitary and hygienic living. Secured effort by Federal Children's Bureau to develop unit of child hygiene work, the Bureau using two employees to work in Cumberland and Swain counties for about eight months. Laboratory of Hygiene buys land and erects its own

building. Sanatorium making a decided impression on the State. Annual appropriation, \$55,500.

1917. The General Assembly passed the following important health legislation: Chapter 263, entitled "An act to prevent and control the occurrence of certain infectious diseases in North Carolina;" chapter 244, entitled "An act to provide for the physical examination of the school children of the State at regular intervals;" chapter 276, entitled "An act for the coöperative and effective development of rural sanitation;" chapter 257, entitled "An act to prevent blindness in infancy, designating certain powers and duties and otherwise providing for the enforcement of this act;" chapter 66, entitled "An act to provide for the sanitary inspection and conduct of hotels and restaurants;" chapter 286, entitled "An act to regulate the treatment, handling and work of prisoners."

Following the enactment of this legislation, administrative machinery, consisting of a Bureau of Epidemiology under the direction of Dr. A. McR. Crouch, a Bureau for the Medical Inspection of Schools under the direction of Dr. Geo. M. Cooper, and a Bureau for County Health Work, under the direction of Dr. B. E. Washburn, was established. Dr. Washburn, an officer of the International Health Board, was loaned to the State without cost and the International Health Board, in addition to furnishing Dr. Washburn, appropriated \$15,000 annually for rural sanitation in accordance with the provisions of chapter 276.

The United States Public Health Service in February, 1917, detailed Dr. K. E. Miller to study county health work in different sections of the country and to establish for demonstration purposes, in Edgecombe County, department of health on an economic basis easily within the financial reach of the average county.

The State Laboratory of Hygiene moved into its own building January 15, 1917.

The State was admitted to the registration area of the Union for births in January, 1917, the Bureau of the Census having found after investigation that our birth registration was 96 per cent complete.

The special campaign against typhoid fever begun so satisfactorily in 1915, was continued. Free vaccination of the people, however, was interfered with by the difficulty in securing medical officers to do the work, the preparedness program of the Government having caused many physicians and nurses to enter the Army and Navy; nevertheless, a total of 30,000 citizens of the State were vaccinated as a direct result of the Board's activities, and many thousands of others were vaccinated by the physicians of the State as a result of the educational work of the Board directed to impressing the people with the value of vaccination as a means of prevention for typhoid fever.

In December, 1917, life extension work as developed by the Life Extension Institute of New York, which consisted briefly of the free physical examination of interested citizens for the purpose of advising them as to their physical condition and needed

hygienic reform and medical treatment, was begun on a county basis. The funds necessary for this work were appropriated partly by the State and partly by the counties in which the life extension work was carried out. Dr. Amzi J. Ellington, who at the time was a resident physician in the New York City Hospital and who had during his residency in that institution studied the methods of the Life Extension Institute under Dr. Eugene Lyman Fisk, was employed and placed in charge of the work. Life extension work was carried out in Vance, Alamance, Lenoir and Robeson counties, and resulted in the full physical examination of 4,000 citizens. This work was very favorably received, and the outlook for its continued development seemed excellent when, with the declaration of war and the call for physicians to enter the military service of the country, Dr. Ellington enlisted in the Medical Corps of the Army. For this reason, and for the further reason that it has been almost impossible to secure health officers during the past two years, the work was not resumed.

The educational work of the State Board of Health consisted in the issuance of eight Bulletins, each monthly edition amounting to 45,000, and a daily newspaper health article. The Bureau continued its moving picture show exhibit and, in addition, prepared probably the best three-dimension educational exhibit in the United States. In 1917 the following exhibits were given: motion picture entertainments, 236; traveling public health exhibits, 32; special exhibits, 58; stereopticon entertainments, 3—to a total of 95,000 people. Arrangements were made for the preparation of newspaper plate, which was sent to and extensively used by 202 papers having a total circulation of 303,000. A large part of this newspaper material was prepared by the well-known authority and publicist in matters of sanitary and hygienic education, Dr. W. A. Brady of Elmira, New York.

The annual appropriation for the State Board of Health was \$60,772.16. The annual appropriation for the State Laboratory of Hygiene was \$12,500, and this, in addition to \$9,087.22 in fees permitted under the laws of the State to be paid to the Laboratory for special work, provided the Laboratory with a total annual budget of \$21,587.22.

1918. Much of the work this year was influenced by the war and had to do with preparedness. The State Health Officer visited Washington, at the request of the Council of National Defense and as chairman of a committee of State Health Officers, on a number of occasions for conferences with respect to preparedness measures, provisions for the control of venereal diseases, arrangements for coördinating the control of infectious diseases in the civilian population with their control in cantonments, and to arrange, if possible, with the Public Health Service and the Surgeon-General of the Army for preserving the personnel of State health departments during the war. The State Health Officer also made a visit to the states of South Carolina, Georgia, Alabama and Florida for the Council of National Defense in order,

if possible, to interest the Governor, the State Board of Health, and the State Council of Defense in venereal disease control.

Considerable time was given to assisting Major John W. Long, Medical Aide to the Governor, in the work of organizing the Medical Advisory Boards and in interesting physicians in entering the medical service of the Army and Navy, and, later in the year, in inducing the physicians of the State to become members of the Volunteer Medical Service Corps.

Partly as a result of these activities, the Surgeon-General of the Army assigned Major Joseph J. Kinyoun to assist the State Board of Health in the control of communicable diseases, the Board being under no financial obligation for Major Kinyoun's assistance; and as a result of the successful termination of the activities of various interests looking to a more effective control of venereal diseases, the Kahn-Chamberlain Bill passed Congress, and made available to the State of North Carolina, and without condition \$23,988.61 for venereal disease work.

The Laboratory during this year began the distribution of a high grade of diphtheria antitoxin.

The Bureau of Medical Inspection of Schools developed, and with a degree of success that we may say established, free dental clinics for the public schools of the State. The Bureau also developed to a successful extent an arrangement in the form of adenoid and tonsil clubs for the practical and economic treatment of public school children suffering from these defects.

The Bureau of Epidemiology employed two third-year medical students, equipped them with motorcycles, and put them into the field to investigate infringements of the quarantine law. Sufficient convictions were obtained to impress the medical profession with the determination of the State to enforce its health laws, and a fairly satisfactory compliance with the laws regarding the reporting of communicable diseases was brought about.

The Bureau of Venereal Diseases, paid for by the Federal appropriation, was established in September under the directorship of Dr. James A. Keiger of Charlotte, N. C.

Mr. Warren H. Booker, for the last seven years the efficient director of the Bureau of Engineering and Education, left in September for Red Cross work in France, the work of his bureau being continued, with the exception of the engineering work, by Mr. Ronald B. Wilson. As a result of Mr. Booker's leaving, certain funds became available, and a Bureau of Infant Hygiene, under the directorship of Mrs. Kate Brew Vaughan, was organized late in 1918.

Perhaps the most outstanding feature of the health work during the year 1918 was the epidemic of influenza. The epidemic began early in October and caused in October alone 6,056 deaths; in November 2,133 deaths; and in December 1,497 deaths, a total during the last three months of 9,686 deaths.

The annual appropriation for the State Board of Health for 1918 was \$73,210.38.

The annual appropriation for the State Laboratory of Hygiene was \$12,500. The Laboratory, during this year, collected \$8,532.48 in fees for special work, so that the total income of the Laboratory for this year was \$21,032.48.

1919. The General Assembly passed the following important health legislation: Chapter 71, entitled "An act to prevent the spread of disease from insanitary privies;" chapter 192, entitled "An act to provide for the physical examination and treatment of the school children of the State at regular intervals;" chapter 206, entitled "An act for the prevention of venereal diseases;" chapter 213, entitled "An act to require the provision of adequate sanitary equipment for public schools;" chapter 214, entitled "An act to obtain reports of persons infected with venereal diseases;" chapter 215, entitled "An act for the repression of prostitution;" and chapter 288, entitled "An act to amend chapter 671, Public-Local Laws of 1913, relating to the injunction and abatement of certain nuisances."

The Bureau of Engineering and Inspection was organized in April. The engineering work of the Board had been suspended with the resignation of Mr. Warren H. Booker in September, 1918, Mr. Booker having gone to France to engage in tuberculosis work under the direction of the Red Cross. Between September, 1918, and April, 1919, the engineering problems coming before the Board had been referred and very kindly and effectively taken care of by Col. J. L. Ludlow of Winston-Salem. Mr. H. E. Miller, an engineer and a graduate of the University of Michigan, was placed in charge of the new bureau, and his brother, Dr. K. E. Miller, of the United States Public Health Service, was detailed by the Service to assist him in the organization of his work. Mr. H. E. Miller and Dr. K. E. Miller spent the spring and summer and a part of the fall in studying various types of privies, in preparing plans for the construction and maintenance of privies, and in preparing the necessary notices and literature to inform the people of the objects and requirements of the new privy law.

On May 1st Dr. A. J. Warren, health officer of Rowan County, was appointed to and accepted the position of Assistant Secretary of the Board.

On July 1st Mr. R. B. Wilson accepted the position of Director of Public Health Education.

On August 1st Dr. A. McR. Crouch, Director of the Bureau of Epidemiology, resigned to accept a position with the city of Wilmington. Dr. F. M. Register, whole-time health officer of Northampton County, succeeded Dr. Crouch as director of the bureau.

In September Dr. J. R. Gordon, Director of the Bureau of Vital Statistics since 1914, resigned on account of impaired health, and on October 1st the Bureau of Epidemiology and the Bureau of Vital Statistics were combined and placed under the direction of Dr. Register.

In September Mrs. Kate Brew Vaughan, Director of the Bureau of Infant Hygiene, resigned. The bureau was reorganized under

an understanding with the American Red Cross and was enlarged to include, in addition to infant hygiene, the problem of public health nursing, the name of the bureau being changed to that of "Bureau of Public Health Nursing and Infant Hygiene." Under the agreement with the Red Cross this bureau was to have an available appropriation of \$12,000 a year, half of which was to be furnished by the American Red Cross and half by the State Board of Health. The personnel of the bureau and its plan of work, under the agreement, was made contingent upon the approval of both participating agencies, the American Red Cross and the State Board of Health. In December Miss Rose M. Ehrenfeld took charge of the new bureau and began its organization and work.

On October 1st Dr. Jas. A. Keiger, Director of the Bureau of Venereal Diseases, resigned and Dr. Millard Knowlton was appointed to succeed him.

The typhoid campaign carried on during the summer through previous years, was continued in the summer of 1919, using third-year medical students, furnished either with automobile or motorcycle for getting about. Campaigns were carried out in the following counties: Bertie, Cabarrus, Chatham, Chowan, Columbus, Craven, Hertford, Iredell, Johnston, Lincoln, Onslow, Pasquotank, Perquimans, Randolph, Richmond, Rockingham, Stanly, Union, Warren, Wayne. A total of 49,076 were given complete vaccinations.

The educational work of the Board consisted of the publication of a 48,000 monthly edition of the Bulletin, and the distribution of about 350,000 pieces of public health literature.

The funds available during this fiscal year amounted to \$198,549.14, of which \$102,301.98 was from State appropriations and the remainder from outside sources.

The appropriation for the State Laboratory of Hygiene for this year was \$28,500; in addition to this, the Laboratory collected in fees for special work, for antitoxin, and in water taxes a total of \$14,344.02, making a total of \$42,844.02 available for work of Laboratory.

1920. During this year there was a Special Session of the General Assembly, lasting twenty days and held in the latter part of August. This Special Session passed an act amending the vital statistics law, making the fees for local registrars 50 cents instead of 25 cents for each certificate properly filed with the State Board of Health.

On January 1st Dr. B. E. Washburn, who had had general direction of the coöperative county health work and who had rendered most acceptable service, was recalled by the International Health Board and detailed to take charge of their interests in Jamaica. Dr. K. E. Miller, of the United States Public Health Service, who had been detailed in January, 1917, to organize a model county health department in Edgecombe County and then, in 1919, to assist his brother, Mr. H. E. Miller, in organizing the work of the new Bureau of Engineering and Inspection,

to which was assigned the duty of enforcing the State-wide privy act, succeeded Dr. Washburn as Director of the Bureau of County Health Work.

In January a coöperative effort with the United States Public Health Service and the International Health Board to demonstrate the possibilities and advantages of the eradication of malaria from certain towns and cities in the eastern part of the State was begun. The terms of coöperation were that the International Health Board and the State Board of Health were to pay one-half of the expenses of the local work and the town or city in which the work was done the other half, the Public Health Service furnishing, as its part, expert supervising personnel. The towns and cities chosen for this work were Goldsboro, Farmville, and Greenville, the budgets for each municipality being, respectively: Goldsboro, \$13,670.98; Farmville, \$5,000; and Greenville, \$9,000, a total investment in this work of \$27,670.98. Mr. A. W. Fuchs, Associate Sanitary Engineer, was detailed by the Service to have supervision of the work.

In February Dr. A. J. Warren, Assistant Secretary of the State Board of Health, resigned his position in order to accept the appointment of city health officer of Charlotte, N. C.

In the winter and spring of 1920, the North Carolina Land-owners' Association, under the progressive leadership of Mr. W. A. McGirt, of Wilmington, undertook a very extensive educational campaign against malaria, which was carried on through the public schools of thirty-eight counties in eastern North Carolina. A series of county and State prizes for the best essay on malaria by public school children were offered as an inducement to the school children to interest and inform themselves, and, indirectly, their parents, with regard to the importance of this disease. To make possible this work by the school children 75,000 malaria catechisms, prepared by Dr. H. R. Carter, of the United States Public Health Service, were distributed through the public schools of the eastern part of the State to the school children. Thousands of essays were written, and it is reasonable to believe that the campaign was one of the most successful public health educational attempts yet undertaken.

In June it was found advisable to separate the Bureau of Epidemiology and the Bureau of Vital Statistics which had, on account of the scarcity of health officers, been placed under the directorship of a single bureau chief, Dr. F. M. Register. Dr. Register was appointed Director of the Bureau of Vital Statistics and Dr. J. S. Mitchener was appointed Director of the Bureau of Epidemiology.

In April the Interdepartmental Social Hygiene Board assigned to the State Board of Health several workers for making a study of vice conditions in North Carolina towns and cities and for taking such steps as were found expedient for decreasing prostitution. This group of workers was withdrawn in September, on account of differences developing between them and Dr. Knowlton, chief of the Bureau of Venereal Diseases, with the understanding

that another group of workers would be assigned to this work at a later date.

In June arrangements were made with the United States Public Health Service and the American Social Hygiene Association for the development of an elaborate educational unit on sex hygiene and venereal diseases designed to reach rural meetings through the use of picture films and a portable truck. An outfit consisting of several lectures and a moving picture truck began work in Cumberland County in August, and from its very beginning met a most cordial reception and gave every promise of developing into one of the most useful agencies for dealing with the venereal disease problem.

During the year the anti-typhoid vaccination campaign was continued in Alamance, Bladen, Columbus, Duplin, Franklin, Gaston, Harnett and Mecklenburg counties. Coöperative campaigns, in which the counties furnished the working personnel, were also carried on in Anson, Johnston and Rutherford counties. A total of 29,435 citizens have been vaccinated against the disease, and this does not include Columbus County, in which the work was just beginning when this report was completed.

The educational work of the State Board of Health during this year consisted of a 48,000 monthly edition of the State Board of Health Bulletin and the distribution of approximately 350,000 pieces of public health literature.

The funds available during this fiscal year amounted to \$342,284.33, of which \$176,152.61 was State appropriation and the remainder from outside sources.

The appropriation for the State Laboratory of Hygiene for this year was \$25,000; in addition to this, the Laboratory collected in fees for special work, for antitoxin and in water taxes, a total of \$13,698.89, making a total of \$38,698.89 available for the work of the Laboratory. The above amount being insufficient, the Special Session of the Legislature authorized a loan of \$15,000 to enable the work of the Laboratory to be carried on, making a total of \$53,698.89 available for the work of the Laboratory during this year.

1921. The Legislature meeting early in January of this year was asked by the Board to amend the State law restricting the salary of the executive officer of the Board to \$3,000 annually, so as to make the salary \$5,000. Such an amendment was passed. A further request from the Board was that legislation be enacted removing the inspection tax of forty cents from privies coming under the supervision of the Board of Health. Such an amendment to the State-wide Privy Law was also enacted. A bill was introduced in this session of the General Assembly under the initiative of Hon. Emmet H. Bellamy requiring a physical examination of all applicants for marriage and making issuance of license contingent upon the physical qualifications of the applicant. The State Board of Health approved and supported Mr. Bellamy's bill, realizing, as did the author of the bill, that the proposed legislation was but a step in the right direction and was,

therefore, rather loosely drawn and left many things to be desired. The bill finally passed in amended form as chapter 129, Public Laws of 1921.

The general health of the State for 1921, as indicated in the vital statistical records for that year, published by the United States Bureau of the Census, was good, and there was an improvement in reduced death rates for a number of diseases, as well as a reduction in the general death rate over previous years.

Another general condition of State-wide importance with a vital bearing on the work of the Board of Health which had to be taken into account was a considerable amount of misunderstanding between respective groups of the medical profession and the Board of Health regarding matters of policy. Many physicians, men in good standing professionally and men with high civic ideals, seemed to feel that the Board of Health had no well-considered and reasonable objectives in the field of public health as it is related to that of private practice. This general condition was responsible for the Board of Health seeking and availing itself of opportunities to meet the profession, both in county, district and State societies, and to discuss with the profession what it conceived to be the proper relation between public health activities and professional practice. This subject was presented to and considered by the State Medical Society in its conjoint meeting with the State Board of Health at Pinehurst in April, 1921. See transactions Medical Society of the State of North Carolina, pages 472-506. As a result of these various conferences between representative men engaged in public health work and the profession, the general condition of misunderstanding and some little friction had disappeared to a large extent by the latter part of the year. Nevertheless, the results of contact between those engaged in social medicine and private practice were such as to encourage further conferences and efforts to bring about a fuller recognition of mutual interests on the part of the public and the profession, and the ultimate adoption of a program of relations which would be to the mutual advantage of both parties.

Perhaps the most important change inaugurated in State health administration during this year was the adoption of a cost basis for standardizing and measuring the efficiency of public health work in those counties in which the State participated financially. This new principle is fully described in the State Board of Health Bulletin for January, 1922, and a further discussion of cost basis for public health work is unnecessary here except, perhaps, to say that it is apparently at least one of the first attempts to introduce the cost system of industry into government.

The Bureau of Venereal Diseases, in charge of Dr. Millard Knowlton, established as a part of the war-time activities of the Board in coöperation with the Bureau of Venereal Diseases of the Federal Government, was combined with and made a part of the work of the Bureau of Epidemiology, under the general direction of Dr. J. S. Mitchener.

Funds available for the year included: State appropriation, \$275,000; miscellaneous receipts, \$164,184.42; total, \$439,184.42.

1922. In order to bring the records of this department into harmony with those of other State departments, in accordance with the act of the General Assembly of 1921, changing the fiscal year of the State so as to begin on July 1st each year, this report ends with June 30, 1922. It, therefore, covers a period of nineteen months; one full fiscal year from December 1, 1920, to November 30, 1921; seven months from December 1, 1921, to June 30, 1922. Effective February 1, the American Red Cross Society abrogated the agreement existing since 1919 by which it jointly financed with the Board of Health, the Bureau of Public Health Nursing and Infant Hygiene. This bureau was reorganized April 1 as the Bureau of Maternity and Infancy, for its maintenance the State receiving \$27,259.66 annually from the United States Government in accordance with the Sheppard-Towner Act for the promotion of the welfare of mothers and infants. Dr. K. P. B. Bonner of Morehead City, was secured as the director of the reorganized Bureau, with Miss Rose M. Ehrenfeld as supervisor of nursing and Mrs. T. W. Bickett in charge of educational work.

The funds available during this period, and their distribution, were seven-twelfths of the amounts set out under the tabulation for 1921.

The appropriation for the State Laboratory of Hygiene for the nineteen months between December 1, 1920, and June 30, 1922, was \$87,083.33; in addition to this, the Laboratory collected in fees for special work, for antitoxin, and in water taxes, a total of \$30,872.51, making a total of \$117,955.84 available for the work of the Laboratory.

- 1922-23. In order to further develop local responsibility for the protection and promotion of the public health, and to quicken local initiative, a policy of decentralization was adopted by the Board. To carry out this policy there were made several changes in the organization of the Board's executive staff. The Bureau of County Health Work was discontinued. The Bureau of Epidemiology was combined with the Bureau of Vital Statistics. Dr. G. M. Cooper, director of the Bureau of Medical Inspection of Schools, was appointed Assistant Secretary, and Dr. J. S. Mitchener, director of the Bureau of Epidemiology, was transferred to the Bureau of Medical Inspection of Schools. Dr. K. E. Miller, who for four years had been loaned to the Board by the United States Public Health Service, and had directed the work of the Bureau of County Health Work, was recalled for duty elsewhere. The State was divided into four districts with Dr. E. F. Long, Dr. H. A. Taylor, Dr. M. L. Ilsley, and Miss Rose M. Ehrenfeld as district directors. This plan of organization became effective in the early spring of 1923 and was continued through the calendar year.

Six vacancies in the membership of the Board occurred during the year, four by expiration of term, and two by resignation. The terms of Dr. J. Howell Way of Waynesville, and Dr. A. J. Crowell of Charlotte, appointed by the Governor, expired, and

they were respectively appointed to succeed themselves. The terms of Dr. Charles O'H. Laughinghouse of Greenville, and Dr. Thomas E. Anderson of Statesville, elected by the State Medical Society, expired, and they were respectively reelected. Mr. Charles E. Waddell of Asheville, appointed by the Governor in 1921, resigned and as his successor the Governor appointed Mr. James P. Stowe of Charlotte. Dr. F. R. Harris resigned to become health officer of Vance County, and to fill the unexpired term the Board elected Dr. D. A. Stanton of High Point. Dr. J. Howell Way was reelected president of the Board.

The General Assembly of 1923 made provision for the constantly growing work of the Board, approving the budget as submitted and appropriating for the Board the sum of \$425,000. Legislation enacted included an act to provide for the sanitary manufacture of bedding, to create an independent board of directors for the State Sanatorium, and to provide sanatorium facilities for tuberculosis convicts.

The important new development during the year was the beginning of malaria control work in certain counties of the coastal plain area of the State. Through the courtesy of the International Health Board a member of its field staff, Dr. H. A. Taylor, was loaned to the Board for the purpose of making preliminary surveys, and areas in Lenoir and Pamlico Counties were selected for investigation. The results showed Pamlico County to be suitable for the initial demonstration, and a unit for the investigation and control of malaria was organized with Dr. Taylor as the director, the budget being contributed forty per cent by the county, forty per cent by the State, and twenty per cent by the International Health Board. The progress of the work, and the results achieved, proved so satisfactory that in January, 1923, an additional unit was organized in Beaufort County, and in May, Craven and Bladen Counties were added to the list. Detailed résumés of this work is given elsewhere in this report, but it should be stated here that the success of the intensive malaria control measures has been even greater than was anticipated. While specializing on malaria control measures, the county units have at the same time carried on a general program of public health work. The International Health Board has continued its coöperative aid in giving twenty per cent of the unit budget, and has continued the loan of Dr. Taylor, who has directed the work.

In June the resignation of Dr. J. S. Mitchener as director of the Bureau of Medical Inspection of Schools was accepted, and Dr. Roy C. Mitchell, who had been engaged in special educational field work, was appointed to the vacancy.

- 1923-24. The Committee on Municipal Health Department Practice of the American Public Health Association requested the Secretary of the Board to become field director for the Committee in making a study of municipal health practices in the United States for the purpose of working out with and for the Committee a basis or set of principles on and through which city health departments could be given classification or grading, and further for giving

such additional time as might be needed in assisting such departments in improving their organization and provision for work. The request was brought before a special meeting of the Executive Committee of the Board, and it directed the Secretary to take advantage of the opportunity offered to become acquainted intimately and broadly with health administration in the cities of the country, and at the same time continue to exercise general supervision of, and executive control over, the work of the Board. In January the Secretary established official headquarters in New York City for the work of the Committee, and the general organization of the executive staff of the Board was continued with the Assistant Secretary, Dr. G. M. Cooper, as administrative or director. During the period of his absence the Secretary has kept in close touch with the work of the Board through frequent reports and a number of visits to the office for conferences with members of the staff.

For the more efficient administration of the field activities of the Board the four districts into which the State has been divided the previous were consolidated into two, with Dr. E. F. Long and Dr. H. A. Taylor as Deputy State Health Officers, as directors, assisted respectively by Dr. C. N. Sisk, formerly health officer of Forsyth County, and Dr. George Collins, formerly health officer of Mecklenburg County.

At the annual meeting for the Board in April further steps were taken towards making effective the policy of decentralization adopted the previous year. This policy looks, in a broad way, to the diminishing of State personnel and the use of funds so made available for stimulating and paying county personnel, either whole or part time, to do work which formerly had been in all probability incorporated and carried on by full-time personnel employed by the Board. It was directed by the Board that all machinery and resources of the Bureau of Maternity and Infancy and of the Bureau of Medical Inspection of schools be converted into county machinery and resources, either full-time or part-time, the transformation to be brought about gradually to become effective not later than January 1, 1925.

During the year a plan for the more adequate sanitary control of public milk supplies in the State was formulated. The development of this important new undertaking was assigned to the Bureau of Engineering and Inspection. Mr. Malcolm Lewis, a graduate of Massachusetts Institute of Technology, and with about seven years of experience in public health work, was secured for this particular unit of work. As developed at the present time this service has been largely an advisory one, the various municipalities having at their command the aid of the Board in improving local milk supply conditions.

The malaria control campaign in the coastal plain area was enlarged by the addition of organized units in Columbus, Brunswick and Hyde counties, making a total of seven counties in the State specializing on this plan of health work. The coöperative aid of the International Health Board was continued.

During the year Dr. Roy C. Mitchell, director of the Bureau of Medical Inspection of Schools, resigned. The work of the Bureau was continued under the supervision of the Assistant Secretary. Dr. M. L. Ilsley and Miss Rose M. Ehrenfeld, both district directors, resigned, and effective with the end of the fiscal year Dr. K. P. B. Bonner, director of the Bureau of Maternity and Infancy, resigned.

The appropriation by the General Assembly was \$275,000 and \$300,000 respectively for the two years of the biennium. For the Laboratory of Hygiene the appropriation was \$75,000 annually.

- 1924-25. During this year the work of the Board was directed by Dr. G. M. Cooper, serving as Acting Secretary. Dr. Rankin continued his work with the American Public Health Association. In June, 1925, Dr. Rankin resigned to accept the position of director of the hospital and orphanage divisions of the Duke Foundation.

The system of district direction of county health work was dropped, district health officers resigning not being replaced. Dr. E. F. Long and Dr. C. N. Sisk were placed in charge of county health work, and upon the resignation of Dr. Long the responsibility for this work was left upon Dr. Sisk. Dr. K. P. B. Bonner resigned as Director of the Bureau of Maternity and Infancy, and Dr. H. A. Taylor was appointed to succeed him, with Dr. George Collins as assistant. On December 1 a division of Health Education was organized with Dr. M. L. Townsend in charge.

- 1925-26. Dr. Chas. O'H. Laughinghouse of Greenville, was elected Secretary to fill the unexpired term of Dr. W. S. Rankin, resigned, to take office October 1, 1926. Dr. M. L. Townsend resigned as Director of the Bureau of Health Education and Dr. G. M. Cooper succeeded him.

ORGANIZATION OF BOARD

The work of the State Board of Health is administered by the State Health Officer and an executive staff, the members of which have definitely assigned duties.

The Board consists of nine members, five appointed by the Governor and four elected by the State Medical Society. The terms are six years, and interlock. Not more than two of the Governor's appointees nor more than two elected by the Medical Society expire in any one year. The Board has certain legislation authority, having the power conferred upon it to adopt rules and regulations having the force and effect of law.

The work of the Board is now divided into the following bureaux or divisions:

Administration: Headed by the State Health Officer with general supervision of the entire program of work.

Laboratory: For diagnostic examination of various specimens, and of samples from public water supplies, and for manufacture and distribution of various vaccines and sera.

Sanitary Engineering and Inspection: Enforce sanitary laws; supervise public water supplies and sewerage systems; investigate problems of stream pollution; supervise municipal milk sanitation; supervise shellfish sanitation.

Maternity and Infancy: Supervise maternal and infant hygiene nursing service; conduct prenatal educational service; midwife control.

Medical Inspection of Schools: Through staff of nurses gives medical inspection of schools in one-third of the counties each year; conducts annually tonsil-adenoid corrective clinics; conducts dental clinics.

Epidemiology: Enforces laws regarding communicable diseases; makes epidemiological investigations; conducts campaigns for immunization against typhoid fever, diphtheria, smallpox; makes malaria and mosquito surveys.

Vital Statistics: Gathers through local registrars reports of births and deaths; tabulates and indexes certificates; keeps permanent file of all certificates.

Health Education: Prepares educational literature, special pamphlets, edits monthly Health Bulletin, and conducts unit in visual education.

Life Extension: Promotes periodic health examination for prevention of degenerative diseases; conducts special demonstration clinics for medical profession.

County Health Work: Supervises and assists county health departments to which State contributes financially.

HEALTH—THE STATE'S GREATEST ASSET

North Carolina rejoices today in the lowest death rate since the pioneer days of its first settlement. For the past year of 1927 a new low record was achieved, 11.3 per thousand of the population. This was under the rate for the United States' registration area which now includes approximately 85 per cent of the population of the country. Again, it is demonstrated that North Carolina is not only a healthful State in which to live, but that it is in fact one of the most healthful of all the States in the Union.

This has not always been true. Not so many years ago the State was hampered and its material progress checked by the prevalence of hookworm disease and malaria. Smallpox was an ever-present menace, scarring and killing. The "Great White Plague" of tuberculosis each year claimed its thousands of victims. Typhoid fever was a constant summer scourge, killing and maiming. One out of every five of the babies born in the State died before reaching a first birthday.

This condition was due to a number of causes. On account of its geographical location, the State was especially susceptible to semi-tropical diseases, hookworm and malaria. Because of its predominant rural population, typhoid fever and other fecal-borne diseases, particularly the diarrheal diseases of infants, largely affected the public health. Unprotected public water supplies and general insanitary conditions throughout the State contributed to the high death rate.

Today the picture is entirely changed. North Carolinians are a well and happy people, vigorous and able whether at work or play. Co-incident with the tremendous development during the years of the present century in agriculture and industries has been an improvement in general health conditions even more remarkable.

Today it is true that no great number of our people are anaemic and weak from the effects of hookworm disease. That affliction is becoming rare in the State. Chills and fever and the sallow complexion of those chronically malarious now is so uncommon as to evoke comment, for malaria has been practically eradicated except from certain coastal sections as yet undrained or only partially developed agriculturally. Smallpox now kills less in a year than that comparatively new hazard to life, the automobile, kills in a week. The annual death toll from tuberculosis has been cut more than half. Through sanitation and vaccination typhoid fever has been removed as a major factor affecting the public health. Simultaneously the infant death rate, following increased knowledge of sanitary living and the protection of public water and milk supplies, has been reduced more than one-half so that now instead of one out of each five of the babies born in the State dying during the first twelve months of life the ratio is one out of each thirteen.

The vital statistics records for the State as compared with those of the Nation shows that North Carolina has made a markedly greater degree of improvement in the health of its people since 1900 than has its neighboring states, or the country as a whole. In 1900 the death rate for the entire registration area of the United States was 17.6 per thousand of the population. At that time North Carolina had no accurate records, but from

the most accurate data obtainable it is estimated that the death rate for the State was approximately 22.0 per thousand of the population. This extremely high death rate has been steadily pulled downward until last year it was 11.3 per thousand of the population as compared with 11.4 for the country as a whole. While the death rate for the Nation was falling 35 per cent, that of North Carolina dropped practically fifty per cent.

This remarkable reduction in the death rate is the more noteworthy when considered in connection with the high birth rate. Last year there were 83,334 births in the State, a rate of 28.8 per thousand of the population. For the eighth consecutive year the State has maintained the highest birth rate in the United States. This means an addition annually to the population of a large group which is most susceptible to a number of fatal diseases.

Tuberculosis, which holds a place throughout the world as one of the major causes of death, in 1927 claimed more than three thousand less victims in this State than in 1910, just seventeen years previous. The total number of deaths from this cause last year was 2,769, giving the State a rate of 96.8 per hundred thousand of the population. This rate is considerably under that for the country as a whole and is lower than any other Southern State. This enviable record was made despite the fact that nearly five hundred deaths from tuberculosis were of non-residents of the State, patients at government or private sanatoria maintained in North Carolina because of its excellent climatic advantages.

Sustaining the vital statistics records are the findings of the United States government in connection with medical examinations made of men called for military duty under the Selective Service Act. Figures are now available on the basis of more than two and one-half million men examined, of which number fifty thousand men were from North Carolina. This study gives a cross-section of the physical condition of the male population at an age when physical defects that may shorten life are beginning to appear, and may be taken as a good picture of the general physical condition of the people.

These statistics show that North Carolina averaged fewer rejections because of physical unfitness than the country as a whole, and on individual points ranked well above the average. As compared with the entire country there were in this State fewer defects per thousand, fewer defective men per thousand, fewer mechanical defects, less hernia, less underweight, fewer defects of the eyes, ears, throat, less organic heart disease, and less defective and deficient teeth.

This State is today perhaps the best sanitated State in the Union, considering its predominant rural population. For ten years it has had State laws requiring the sanitary disposal of human excreta. In this North Carolina was a pioneer, being the only State with such beneficial laws until in 1927 the legislature of Alabama gave that state legislation based upon that of North Carolina. Practically the entire urban population is now served with protected public water supplies and with water sewerage. The semi-urban and village and a large portion of the rural population is protected by a system of sanitary privies which are required to be constructed and maintained sanitarily in accordance with plans and specifications approved by the State Board of Health.

Three factors have been primarily responsible for the changed health condition of our people, a change that in twenty-five years has brought the State from near the bottom to a point close to the top. First of all the State has been tremendously fortunate in having an alert and intelligent medical leadership, and with this has been a heartily coöperative profession. Such men as Wood, Lewis, Way, Rankin, have achieved national and international reputations for their leadership in preventive medicine, and their labors for their fellowmen have been of inestimable value. Second, the newspapers of the State, day by day, week by week, have carried on an educational program for sanitation and hygienic living. Third, the General Assembly has consistently enacted needed legislation for the protection of the public health and biennially has provided adequate appropriations for the maintenance and development of public health measures.

A natural sequence of the combination of these three factors has been the increasing realization of our people that health, like charity, begins at home. In Guilford County on June 1, 1911, was established the first county health department to be organized in the United States. Today North Carolina has 39 county health departments and six city health departments, serving more than one-half of the State's population. In this phase of development North Carolina has been exceeded only by the State of Ohio.

For the protection and promotion of the public health the annual appropriation by the General Assembly is \$441,400.00, exclusive of appropriations made for maintenance and permanent improvements at the State Sanatorium for the treatment of tuberculosis. This puts North Carolina in sixth place in the group of forty-eight States of the Union, the ranking states being Pennsylvania, New York, Illinois, Ohio, Massachusetts, North Carolina. The appropriations made by the counties and cities approximate \$600,000.00 annually.

This investment of money for the purpose of protecting and promoting the public health is probably the best paying one in direct dividends that is made by the State. The fact that the death rate in the past twenty-five years has been cut in half means a saving not only in lives, but in dollars and cents—a sum one hundred times greater than the amount which has been invested to achieve this result.

In addition to the local county and city health departments, the State is served by a health department under the direction of a State Health Officer who devotes his time and energy to this one job. Divisions of this department, each under the direction of a trained expert, consist of a hygienic laboratory, vital statistics, epidemiology, county health work, medical inspection of schools, sanitary engineering and inspection, maternity and infancy, health education, and life extension.

The work of the State Board of Health may be briefly summarized by divisions as follows:

(1) The State Laboratory of Hygiene annually makes 60,000 examinations to assist the physicians of the State in the diagnosis and treatment of their patients; periodically examines samples from all public water supplies; distributes 750,000 doses of typhoid vaccine for the prevention of typhoid fever; distributes 35,000 doses of pertussis vaccine for the prevention and treatment of whooping cough; manufactures and distributes

225,000 doses of smallpox vaccine for the prevention of smallpox; distributes 210,000 doses of toxin-antitoxin for the prevention of diphtheria and 1,500,000 units of antitoxin for the treatment of diphtheria; makes and distributes 1,800 Pasteur anti-rabic treatments, for the prevention of hydrophobia caused by the bites of mad dogs; distributes 5,000 packages of tetanus antitoxin for the prevention of this dread disease; distributes 125,000 ampoules of neo-arsphenamine for the treatment of syphilis; altogether, in water analysis, diagnostic examinations, and in sera and vaccines supplied, the laboratory performs a public service that at ordinary commercial rates would exceed \$1,250,000.00 annually.

(2) The division of vital statistics is charged with the vital bookkeeping of the State, an accounting in terms of life and death of the State's population. Its objective is to secure a permanent record of the more important facts concerning the birth and death of every citizen of the State, and from such records to prepare card indices and tabular classifications in such manner as to make readily available on inquiry the following information:

(a) The total number of births occurring annually in the State; (b) the birth rate of the State, that is, the number of births per thousand of the population; (c) the birth rates by races, white and colored; (d) the number of illegitimate births; (e) the number of still-births attended by midwives; (f) the number of white births attended by physicians; (g) the number of white births attended by midwives; (h) the number of colored births attended by physicians; (i) the number of colored births attended by midwives; (j) all of the foregoing data as to births with respect to each county and city. These facts permit of comparisons of one part of the State with another, of the birth rate of the two races, and of the birth rate of this State with that of the other states and other countries. Such information is necessary in forming conclusions as to vital conditions in North Carolina and in the enactment of suitable legislation for dealing with these conditions. Last year there were 83,334 live births in the State, certificates for which were handled and classified.

(a) The number of deaths occurring in the State annually; (b) the death rate, that is, the number of deaths per thousand of the population; (c) the number of deaths, by races, and the death rates by races; (d) the number of deaths among infants and young children as compared with the births, and the total deaths as compared with the total births, with net gain in population; (e) the total number of deaths by months and year from each of the 209 causes appearing in the International List of Causes of Death; (f) the number of deaths according to age and occupation; (g) the number of deaths according to age and the causes of death; (h) the number of "seasonal" deaths according to months; (i) all of the foregoing data classified according to county, town and city. This information is absolutely necessary to understand vital conditions in the State; to know where intensive health work is needed, against what causes of death health measures should be directed, and whether the work of local health departments is associated with a decrease or no decrease in death rates. Last year 32,764 deaths occurred in the State, certificates for which were handled and classified.

(3) Through its division of Epidemiology, the Board endeavors to control the spread of contagious and infectious diseases. It supervises the

quarantine of approximately 50,000 such cases each year, supplying to each home where any of the contagious or infectious diseases occur, directions for the care of the sick and other precautions necessary to prevent the spread of the disease; makes epidemiological investigations to ascertain the source of infection in such diseases as typhoid fever, diphtheria, etc., when such diseases appear in local epidemics; conducts with the assistance of local physicians mass vaccination campaigns for the prevention of typhoid and diphtheria, covering about 20 counties each year and securing about 40,000 typhoid vaccinations and 10,000 diphtheria vaccinations; supervises a malaria control program in a number of eastern counties, and supervises a number of impounded water projects.

(4) The 39 county health departments through the division of County Health Work are given supervision and advice, together with financial assistance. Assistance is supplied in planning and developing general and special units of local work, demonstrations, educational exhibits, clinics, laboratories, and the like, and assists in the organization of new county departments.

(5) In the division of Medical Inspection of Schools, a field staff of eight nurses, eight dentists and one supervising dentist is maintained. An average of 90,000 school children are being examined by the nurses in those counties not having local health departments. The examinations are for the purpose of discovering the more common defects of childhood such as those of vision, hearing, throat, nose, teeth, skin or orthopaedic deformities. Personal notes are sent to parents advising of such defects as may be found and urging that the child be given the indicated medical care in order that correction may be made.

As a follow-up of this work, the Board conducts during the summer months clinics for operative treatment of children of school age suffering with diseased tonsils and adenoids. A special hospital unit sufficient to care for twenty-five patients is transported by truck. A hospital unit is maintained consisting of a physician to carefully examine the children and administer anaesthesia; eleven experienced nurses, and an orderly. The operating surgeon is a specialist secured on the recommendation of the local county board of health. About 2,000 children are now being treated each year in these summer clinics.

An average of 36,000 school children are receiving dental treatment. This includes not only the cleaning of teeth, silver nitrate treatments or temporary fillings for decayed first teeth, but an average of 30,000 permanent fillings each year, thereby saving that many permanent teeth, the greater portion of which would otherwise be lost. The school dentists doing this work are provided with portable outfits and conduct the dental clinics in the school buildings.

A conservative estimate of the cost value of the work done in the tonsil and dental clinics each year is \$500,000.00, an amount greater than the total appropriation made for all of the work of the Board.

(6) The division of Sanitary Engineering and Inspection is charged with manifold duties all of which intimately affect the public health.

Primarily this division supervises the construction and maintenance of all public water supply and sewerage systems. There are 238 public water supplies under supervision, representing an invested capital of \$40,000,000 and an annual cost of operation of \$3,750,000, serving 30 per cent of the

State's population. The operation of these plants is on the best modern scientific basis and in a manner capable of maintaining the full effectiveness in purification for which the plants were designed. The water supply plants of the State have been virtually built anew in the past ten years and the supervision and advice of the State Board of Health has been of inestimable value in safeguarding the municipalities against incompetent engineering service and inadequate provision for growth. It is noteworthy that all of this work has been handled by North Carolina engineers except a few of the minor improvements.

This division is charged with the enforcement of the State sanitary privy law, the work being carried on by a force of ten sanitary inspectors. In addition to the sanitary privy work, supervising inspectors do hotel and cafe inspection and handle special investigations and complaints. One supervising inspector does jail and convict camp regulation, executing the duties assigned by law to both the State Board of Health and the State Department of Public Welfare.

The milk sanitation division is assisting in the protection of milk supplies in 48 municipalities which have adopted the standard milk ordinance. This now includes about 80 per cent of the public milk supply of the State.

The shellfish sanitation division has made a complete sanitary survey of the shellfish growing areas of the State, and supervision is maintained throughout the shipping season. North Carolina shellfish now are accepted in the markets of the country without question.

Special engineering service is now available to the counties in the matter of water supply and sewage disposal installation for consolidated schools. Through this service about 200 school sewage disposal projects are being handled each year, the total cost of the work involved in this supervision being \$350,000.00.

A special study of stream pollution is now being made, necessitated by the growing sewage and waste pollution.

Engineering service, in a growing volume, is being supplied to State institutions. This work includes investigations to determine the needs of institutions in water supply and sewerage utilities for the advice of the Budget Commission in recommending appropriations, field surveys, preparation of plans, cost estimates and supervision of construction.

(7) The division of Maternity and Infancy is primarily charged with the responsibility of reducing the infant and maternal death rate. It has the supervision of the 6,500 midwives of the State, and through special classes each year gives courses of instruction to 2,000 of these. Financial aid and supervision is given to twenty counties which have local maternity and infancy nurses. A correspondence course in prenatal care is maintained with an average of 10,000 expectant mothers. Twenty thousand babies are each year registered for whom special literature on infant care and diet is sent. The field nurses personally see 30,000 mothers and advise with them on the care of themselves and their babies. For the prevention of blindness, 8,000 packages of silver nitrate are distributed.

(8) The division of Health Education consists of: (a) preparing copy for the monthly Health Bulletin, a publication of 32 pages with a circulation of 22,000, edited for the general public and containing timely articles on sanitation and personal hygiene. The publication is sent only to those

requesting it. This Bulletin has been rated by competent judges as the best of its class in the United States; (b) preparing special pamphlets on particular health subjects such as cancer, catarrh, care of babies, constipation, colds, care of the eyes, care of the teeth, hookworm disease, malaria, pellagra, tuberculosis, sanitary privies, venereal diseases, typhoid fever, diphtheria, smallpox and the various contagious and infectious diseases. Approximately 1,250,000 pieces of this special educational literature is distributed annually; (c) the preparation of special articles on health subjects for the press of the State; (d) visual education through the means of a mobile motion picture unit in charge of an experienced operator, with showing primarily in the public schools of those counties having organized health departments, this unit being designed especially as aid to the local health officers. During the past year 13 counties were served, with 125 showings given to a total audience of 35,380.

(9) The division of Life Extension was organized in January, 1928. This division was organized to meet a pressing public need, the action by the Board following resolutions by the President and Councillors of the State Medical Society urging the necessity of the work being undertaken. A study of the vital records of the State disclosed that whereas the death rate from the group of communicable diseases declined from 117.6 in 1917 to 35.4 in 1926, the death rate from degenerative diseases in the same ten-year period rose from 318.9 to 374.9. The total deaths from the degenerative group in 1926 was 8,105, a fourth of all the deaths occurring in the State. Included in this group are heart disease, Bright's disease, and cancer, all of which particularly affect the citizenship in the age group of 40-60. The only way to combat the alarming increase in the deaths from these degenerative causes is to get those citizens affected under competent medical care before the disease has reached an acute state. To detect these in their incipient and curable stage, it is necessary that thorough physical examinations be made periodically. The Life Extension division was organized and is functioning with two objectives: (1) to acquaint those physicians residing in the rural sections of the State, and practicing without the aid of hospitals and laboratories, with the technique of making physical examinations of the apparently well; (2) to assist the medical profession in impressing upon the citizenship of the State the fact that through competent physical examinations these degenerative diseases may be discovered in their incipency and alleviated or cured.

Particularly affecting the coastal counties of the east have been two important undertakings, the field studies in malaria control measures and the survey of salt marsh mosquito infestation. While primarily both of these problems are local, in that they are confined to a comparatively limited area of the State, yet they materially affect the public health of the State as a whole and are an important factor in the agricultural and industrial development of the State.

In 1925 the State Board of Health was able to interest the Rockefeller Foundation in malaria control measures to the extent that this Foundation established at Edenton a station for the intensive and thorough study and investigation of malaria control measures. The station is under the direction of Dr. Mark F. Boyd who is assisted by a staff of trained assistants. The study is still in progress and probably will not be concluded for several years yet. From this North Carolina will secure accurate data upon which

it may with confidence go forward towards the goal of complete eradication of malaria from the State.

Second only to the malaria problem in the coastal section is that of the salt marsh mosquito infestation. There are fourteen counties affected, containing approximately 300,000 acres of salt marsh territory, this acreage being distributed as follows: Brunswick 17,000, New Hanover 8,500, Pender 6,300, Onslow 13,000, Carteret 80,000, Camden 8,000, Pasquotank 2,000, Perquimans 2,300, Chowan 9,800, Washington 14,600, Tyrrell 40,500, Hyde 25,500, Dare 53,000, Currituck 12,400.

For the purpose of making a survey of the salt marsh areas of the South Atlantic and Gulf States, the Congress of the United States in 1926 appropriated the sum of \$25,000 and the additional sum of \$10,000 to continue the survey through the fiscal year ending June 30, 1928. Under the auspices of the United States Public Health Service, with Dr. T. H. D. Griffiths in charge, the survey was undertaken. Included in the survey was the investigation of various types of mosquito breeding areas in the salt marshes along the coast from Virginia to Key West, and from Key West to the Mexican border. This survey has already gathered incalculably useful data with reference to the egg-laying and larval habits of sollicitans mosquitoes; conditions which influence their breeding; distance and direction of their flights; and the influence upon them of tides, vegetation, soils, salinity, natural enemies, climatological conditions and so on. In addition to this, extensive studies of the habits of these pests have been going on at Biloxi, Mississippi, Fort Pierce and Vero Beach, Florida, and Wilmington, North Carolina. The survey at Wilmington covered approximately all of the important breeding areas in New Hanover County, and in adjacent territories in Brunswick and Pender Counties. Information from this survey was of such valuable nature that it has put New Hanover County in position largely to decrease the mosquito infestation there.

The necessary appropriation to continue this important work was left out of the regular appropriation bill introduced into the recent session of Congress. So necessary did its continuation appear that the State Health Officer, the Governor and a number of interested citizens urged upon the State's delegation in Congress that this appropriation item be restored. Largely due to the earnest and persistent efforts of Hon. Charles L. Abernethy, ably assisted by Hon. Lindsay Warren and other members of the delegation, an appropriation of \$10,000 was secured. As a result practically the entire remaining salt marsh area in North Carolina will be included in the survey, and the work upon this is now in progress. From it ways and means to control and prevent the breeding of sollicitans mosquitoes, it is hoped will be developed.

North Carolina moves forward, no longer a laggard handicapped by disease and poverty. An intelligent leadership has envisioned the fact that agricultural and industrial advancement depend upon a healthy citizenship, and through the General Assembly has provided the necessary funds for the protection and promotion of the public health. A medical leadership alert to the opportunity presented has carried on, under the direction of the State Board of Health, a continuously winning fight. Today North Carolina is one of the wonder states of the Union—progressive, prosperous, healthful.

BUREAU OF VITAL STATISTICS

Report of Bureau of Vital Statistics for two years, July 1, 1926—June 30, 1928, inclusive.

Since August, 1927, the Bureau of Vital Statistics and Epidemiology have been functioning as separate bureaus, with a director for each.

OBJECTIVES

The Bureau of Vital Statistics is more closely interlocked with other departments of the State Board of Health than any other department.

The reason for all health work is based on vital statistics.

The Bureau of Vital Statistics turns out an immense amount of work each year. One reason for this is because each month a definite amount comes into the office which must be taken care of. Then too vital statistics are becoming more useful as information accumulates from year to year.

When the Bureau of Vital Statistics of the North Carolina State Board of Health was first created, there was no Bureau of Epidemiology, or Maternity and Infancy, no World War, no Veterans Bureau, no Compensation Act, no School Age Law, no Welfare Department, few automobiles, and a smaller population. All of the above departments are making daily calls on the Bureau of Vital Statistics for information, or certified copies of birth and death certificates.

The objective of the Bureau of Vital Statistics is to secure a permanent record of the more important facts concerning the birth and death of every citizen of the State of North Carolina, and from such records to prepare card indices and tabular classifications in such manner as to make readily available on inquiry the following information:

1. (a) The total number of births occurring annually in the State; (b) the birth rate of the State, that is, the number of births per thousand of the population; (c) the birth rates by races, white and colored; (d) the number of illegitimate births; (e) the number of stillbirths attended by midwives; (g) the number of white births attended by physicians; (h) the number of white births attended by midwives; (i) the number of colored births attended by physicians; (j) the number of colored births attended by midwives; (k) all of the foregoing data as to births with respect to each county and city. These facts permit of comparisons of one part of the State with another, of the birth rate of the two races, and of the birth rate of this State with that of the other states and other countries. Such information is necessary in forming conclusions as to vital conditions in North Carolina and in the enactment of suitable legislation for dealing with these conditions.

2. (a) The number of deaths occurring in the State of North Carolina annually; (b) the death rate, that is, the number of deaths per thousand of the population; (c) the number of deaths, by races, and the death rates by races in North Carolina; (d) the number of deaths among infants and young children as compared with the births, and the total deaths as compared with the total births, with net gain in population; (e) the total number of deaths by months and year from each of the 209 causes appearing in the International List of Causes of Death; (f) the number of deaths according to age and to occupation; (g) the number of deaths according to age and the causes of death; (h) the number of "seasonal" deaths according to months; (i) all of the foregoing data classified ac-

cording to county, town and city. This information is absolutely necessary to understand vital conditions in the State; to know where health work is needed, against what causes of death health measures should be directed, and whether the work of health departments is associated with a decrease or no decrease in death rates.

3. Under one and two, information necessary for the public welfare and available under the operation of the vital statistics law has been briefly indicated. But the vital statistics law not only supplies information to legislatures, state and county commissioners, and other administrative bodies, which is necessary for framing conservation measures for human life, but it also records facts which may at any time become of great value to the individual. In matters of tracing ancestry, birth records are invaluable; also in matters of proving age where the fact of age is in question, as for voting, as for the right to marry, as for the right to enter certain industries, as to entering school, as to liability for military service, etc.

METHODS

The Bureau of Vital Statistics secures the birth and death certificates for the births and deaths occurring in North Carolina through approximately fourteen hundred and fifty local registrars, appointed by the chairman of the boards of county commissioners for the various townships and by the mayors for the various incorporated towns and cities of the State. The duties and powers of the local registrars are defined in Consolidated Statutes, section 7113. The county pays the local registrars fifty cents for each birth and death certificate furnished by them to the office of the State Registrar at Raleigh. The vital statistics law makes it the duty of the doctors and midwives in attendance on a birth to file a birth certificate with the local registrar of the district in which the birth occurs and makes the undertaker, or person acting as undertaker, responsible for the filing of the death certificate. The birth and death certificates filed with the local registrars of the State are sent to the Bureau of Vital Statistics on the fifth of the month succeeding the month in which the birth or death occurred. The certificates received in the office of the Bureau of Vital Statistics are examined carefully, and if incorrect or incomplete (as a large per cent of them are) effort is made to secure the information necessary to complete them. Every parent of a legitimate child whose birth is reported is sent a card advising them of the date of birth and whether or not name appears on the certificate. This gives the parent an opportunity to send in to the office the name of the child, in case it does not appear on the certificate, or to make such change in name or date of birth necessary to make certificate an accurate record of birth. The certificates are then classified and tabulated according to county, townships, and registration districts, according to races, according to age at death, according to cause of death, according to death rates and birth rates, etc., in order to make readily available upon request the information mentioned under the heading of Objectives.

ROUTINE WORK

The routine work in the registration of births and deaths is indicated in the following table. This covers period from July 1, 1926, through June 30, 1928, inclusive.

BIENNIAL REPORT

July, 1926—June, 1928

Letters and postals received	*27,504
Casket dealers reports received	7,072
Supplementals received	3,346
Name cards received	11,240
Violation blanks received	51
Acceptance papers received	64
Report cards received from local registrars	24,154
Letters written	16,076
Form letters sent	49,224
Postal cards sent	137,257
Packages of supplies sent	11,301
Bulletins (transferred to another department)	108,304

INDEXING:

Cards made	254,296
Cards proofread	261,401
Cards assorted	242,262
Cards filed	221,054
Credit certificates sent local registrars	1,759
Certified copies made	5,754
Tables made	654
Cards punched and proofread	71,585
Cards furnished Dr. McCain giving information as to deaths from tuberculosis monthly	5,033
Epidemiology reports from death certificates	4,405
Transcripts made and proofread	240,157
Tabulation of births	165,793
Number certificates made in triplicate	5,800
Lines miscellaneous typing	5,290

CERTIFICATES RECEIVED:

Births	164,609
Deaths	68,333
Stillbirths	15,576
Total	248,518
Names checked on undertakers reports with death certificates	8,379
Local registrars visited	315
Doctors visited	105
Undertakers and coffin dealers	105
Register of Deeds	20
Midwives	70

RESULTS OBTAINED

Of course there is always a large per cent of routine work that is impossible to put in a report of this kind, and without going into unnecessary detail, it may be said that the objective of this Bureau, as aforesaid, has been reached, and that all of the information with its vital bearing upon the public health needs of the State and with the public health accomplishments of the State is readily and completely available.

*This total does not include letters and postals received for Bureau of Epidemiology from July 1, 1926, to August, 1927.

BUREAU OF EPIDEMIOLOGY

The Division of Epidemiology and Venereal Diseases, formally connected with the Bureau of Vital Statistics, was organized into a separate Bureau with a full-time Medical Director, July 1, 1927.

OBJECTIVES

To prevent and control the occurrence of infections and contagions with special reference to whooping cough, measles, diphtheria, scarlet fever, infantile paralysis, cerebro-spinal meningitis, chicken pox, septic sore throat, german measles, smallpox, typhoid fever, trachoma, malarial fevers, and venereal diseases.

METHODS FOR OBJECTIVES

For convenience of description, the methods employed by the Bureau in accomplishing its objectives may be divided into two main divisions or units, each having a dual responsibility in the enforcement of rules and regulations pertaining to the control of communicable diseases.

Section I.—The County Unit

A quarantine officer for each county and city having a separate health department in the State has been secured. He is the Bureau's representative in the field, is required to execute oath of office, and is, therefore, designated as assistant collaborating epidemiologist, receiving compensation from their respective counties in accordance with the following provision:

The said certification and the sum paid the quarantine officer by the county authority shall be in accordance with a system of fees determined by the North Carolina State Board of Health for each item of work involved in the duties of the quarantine officer: Provided, however, that the total annual payment for any county shall not be in excess of the sum stated for such county classified according to population as follows:

	<i>Per Month</i>
Counties with a population less than 10,000.....	\$15.00
Counties with a population of from 10,000 to 15,000.....	17.50
Counties with a population of from 15,000 to 25,000.....	25.00
Counties with a population of from 25,000 to 40,000.....	35.00
Counties with a population of from 40,000 to 50,000.....	45.00
Counties with a population over 50,000	50.00

Duties of the Quarantine Officer

The duties of the quarantine officer, acting as assistant collaborating epidemiologist are similar to a certain extent to those designated by the Board to the Bureau of Epidemiology and may be briefly outlined as follows:

- (a) To secure reports from parents, teachers, and physicians of all cases of communicable diseases.
- (b) To keep an accurate record in his office of all reports.
- (c) To transmit all reports daily to the Bureau of Epidemiology.
- (d) To supply the parent, guardian, or householder, when the disease is reported, with rules and regulations governing that person, with a placard to be posted on the house, and with a pamphlet descriptive of the disease, its dangers, cause, mode of infection, and methods of control.

- (e) To inform the teachers in the community where the disease exists that the disease is present, and to supply them with rules and regulations governing the school while the disease is present, and with pamphlets descriptive of the disease, its dangers, cause, mode of infection, and methods of control, to be distributed through the children to the parents represented in the school.
- (f) To make the presence and locations of diseases known to the public by publishing notices in the county paper when the disease appears and how to prevent it.
- (g) To furnish householders forms to report diseases in their community which have not previously been reported.
- (h) To investigate all cases of suspected contagions which have not been reported, to determine the nature of the disease.
- (i) To enforce the laws, rules and regulations governing the control of communicable diseases.
- (j) To make monthly reports to the Bureau of Epidemiology of all the work, educational, administrative, or otherwise, done during the month.

Section II.—Bureau of Epidemiology or State Unit

In order for the reader to more easily comprehend the duties performed by this Bureau, consideration is given to the work under the following heads: (a) General Office Routine, (b) Special Immunization Campaigns for the Prevention of Typhoid Fever, (c) Special Immunization Campaigns for the Prevention of Diphtheria, (d) Investigations to determine the Prevalence of Mosquitoes and to Institute Measures for the Control of Malarial Fevers.

Office Routine

The daily reports of the communicable diseases are recorded by the Bureau of Epidemiology by the counties in which they occur. These are permanent records of the Bureau, and they show the number, location, age distribution, increase or decrease in the number of cases of each disease from month to month and from year to year.

Spot maps are kept, showing the daily occurrence of cases and monthly occurrence of deaths of smallpox, diphtheria, scarlet fever, and typhoid fever, and according to the sections of the State in which they occur, by counties, and townships, and whether the cases are urban or rural.

Charts have been prepared showing the number of cases and deaths for the above four diseases for the years 1918 to 1927, inclusive.

Weekly telegraphic and monthly written reports of all cases of infectious and contagious diseases reported are made to the Surgeon-General, United States Public Health Service, Washington, D. C.

All report cards, blank forms, educational posters, placards and literature on the reportable diseases, and all rules and regulations governing the control of the diseases are prepared and distributed to all assistant collaborating epidemiologists by the Bureau.

During this biennial, 15,697 circular letters have been mailed by the department on subjects pertaining to the reporting and control of communicable diseases.

Weekly bulletins are issued by the Bureau showing the prevalence of typhoid fever, diphtheria, smallpox, scarlet fever, measles and whooping cough by counties. These bulletins are mailed to all assistant collaborating epidemiologists, members of the State Board of Health, and others interested in the occurrence of these diseases in the State. The morbidity

statistics of all reportable diseases are checked against the mortality statistics in order to establish the efficiency of reporting.

Special Immunization Campaigns for the Prevention of Typhoid Fever

During the biennial, special immunization campaigns for the prevention of typhoid fever and diphtheria have been conducted in 37 counties.

The campaigns are conducted in the following manner: The Bureau of Epidemiology circularizes the county and furnishes advertising materials to the county for the mailing list made up from the tax books. (The Bureau makes up mailing list from the records of births in the county, filed with the Bureau of Vital Statistics.)

Physicians who participate in these campaigns are paid 8½ cents a single dose. Physicians make reports to the Bureau on forms supplied for the purpose. These are checked and certifications sent to the County Commissioners for payment.

List of counties in which special campaigns for the prevention of typhoid and diphtheria together with the population immunized:

COUNTY	No. Taking Three Doses Typhoid Vaccine	No. Taking Three Doses Toxin-Antitoxin
1. Alamance (1926)	5,868	1,047
2. Alexander (1927)	4,140	1,266
3. Burke (1928)	6,274	1,812
4. Caldwell (1927)	8,323	1,913
5. Camden (1927)	1,358	1
6. Caswell (1928)	3,446	1,933
7. Catawba (1926)	9,030	2,101
8. Chatham (1926)	2,444	89
9. Dare (1926)	902	478
10. Davie (1927)	3,934	1,314
11. Durham (1928)	No Report*	
12. Gates (1927)	2,006	444
13. Greene (1927)	8,705	2,642
14. Harnett (1927)	10,008	1,780
15. Hertford (1928)	3,549	715
16. Iredell (1928)	10,911	1,848
17. Lee (1928)	8,878	1,510
18. Lincoln (1926)	5,415	1,073
19. Madison (1927)	No Report	
20. Martin (1926)	4,540	1,513
21. Martin (1928)	4,282	1,654
22. Montgomery (1926)	181	44
23. Moore (1926)	5,186	723
24. Moore (1927)	244	---
25. Perquimans (1927)	3,208	295
26. Person (1926)	6,966	1,502
27. Randolph (1926)	5,984	1,940
28. Rockingham (1926)	3,233	422
29. Robeson (1928)	No Report*	
30. Scotland (1928)	3,921	1,016
31. Stanly (1927)	No Report	
32. Stokes (1928)	3,225	839
33. Surry (1928)	No Report*	
34. Warren (1927)	7,055	1,262
35. Washington (1927)	2,258	823
36. Wayne (1928)	No Report*	
37. Yadkin (1928)	7,487	2,160
Total	152,961	36,159

*Whole-time counties.

Total (11 counties—1926)	49,749	10,932
Total (11 counties—1927)	51,239	11,740
Total (9 counties—1928)	51,973	13,487
Grand Total	152,961	36,159

Compiled Monthly Report of Part-Time County Quarantine Officers
July 1, 1926, to June 30, 1928

Cases reported by householder.....	7,992
Cases reported by health officers and nurses	10,290
Cases reported by physicians.....	35,090
Cases reported by teachers.....	3,329
Total number of cases reported.....	56,701
Homes placarded	41,736
Articles published	411
Teachers' certificates	5,838
Indictments	82
Total number cases reported by whole-time quarantine off.	112,050
Grand total cases reported by all 100 counties in State.....	168,751

SUMMARY OF OFFICE WORK

Circular letters	15,697
Oaths of Office	23
Telegrams sent	128
Letters written—Individual	4,070
Multigraphed	4,759
Total all letters	24,526

VENEREAL DISEASE DIVISION

Although since 1924 the distribution of medicinal remedies for the treatment of venereal diseases have been sent out by the State Laboratory of Hygiene, and since the Federal appropriation was discontinued, the Bureau has been unable to maintain public clinics for the treatment of indigent cases, nor has any extensive educational work been conducted. However, the Bureau receives a large number of letters requesting bulletins, pamphlets and advice. These are carefully answered and whatever information requested sent.

The purposes of this dissemination of information are as follows:

- (a) To stimulate the provision of facilities for proper treatment by establishing clinics for persons infected with venereal disease who are unable to pay for treatment from private physicians.
- (b) Information concerning patients dangerous to the public health is referred to local health officers for investigation and action.
- (c) Instruction and advise is given to persons infected with venereal disease concerning the necessity for proper treatment and continuing treatment until cured.
- (d) Tabulations are made from the data collected in an effort to gain knowledge of the prevalence of infection and the best methods of prevention.

In gathering information concerning cases of venereal diseases dangerous to the public health, the Bureau has had recourse to the usual procedure of requiring physicians to report their cases and requiring druggists to report the sale of venereal disease remedies. These reports by physicians and druggists are required by Chapters 206 and 214, respectively, Public Laws of 1919.

The system of reporting provided by law and the regulations adopted by the State Board of Health is designed especially to furnish usable infor-

mation concerning dangerous cases. For this reason physicians are required to report names and addresses only when in their judgment the patients should be under the supervision of the health officer in order to protect the public health. When patients are considered trustworthy, physicians may report their cases by number without disclosure of identity.

Reports that reach the office are so handled that information concerning cases that should be investigated is referred to the local health officer. Every effort is made to encourage reporting by physicians through courteous treatment rather than by harsh measures. In carrying out this policy a number of form letters have been drafted for use in the routine handling of venereal disease case reports.

There has been reported to this office the following number of cases of venereal diseases by part-time quarantine officers:

Gonorrhea	3,852
Syphilis	6,002
Chancroid	290
Balanitis	1
Total	10,145
Total number cases reported by whole-time quarantine off.	7,775
Grand total cases reported by all 100 counties in State	17,920

DIVISION FOR THE INVESTIGATION AND CONTROL OF MALARIAL FEVERS

The work of the State Board of Health on Mosquito and Malaria Control through the division for this purpose, as a result of insistent demand, has increased four-fold in application during the last biennium. In addition to the work in the malarial zone of the State, which had previously absorbed the efforts of the division, three other variations were gone into, namely: 1. The study of impounded water and its effect upon the prevalence of mosquitoes and the incidence of malaria; 2. The investigation of situations which produce pestiferous mosquitoes; 3. The surveying of salt marsh areas conjointly with the U. S. Public Health Service.

Of these issues, circumstances presented the questions surrounding the impounding of water as the paramount mosquito and malaria problem of the period. The damming of streams for developing hydro-electric power was in a stage of expansion. The effect upon health conditions had previously led to long, bitter, and depressing litigation and the issues by no means had been satisfactorily cleared. Adequate study of the situation necessitated application before and after building these projects, therefore, a major portion of the division's time was given to it. Space in the report is allotted accordingly. The other issues, though probably having been more or less constant, were meeting with a continually decreasing degree of tolerance for they were proving more and more to be an obstacle in the courses which progress and development were taking.

The original undertaking of the division in the malarial zone being already well-organized and in operation in the hands of county health units, is adequately covered in previous reports and therefore, not gone into here further than the aid offered in maintaining it and taking up the periodic problems which arose. Detail of the report is given in the order of the subjects named.

Studies on Impounded Waters

Since the year 1904, attention has been focused upon the impounding of water for commercial purposes to an unprecedented degree. The electrical developments which have made practical the broadspread utilization of water power even to remote locations have created for the country assets which can be estimated only in hundreds of millions of dollars.

North Carolina has had a large share in this harnessing and utilizing of a wasting natural resource. It now holds fourth place among the states in developed waterpower and second in developed horsepower as compared to population. In this State alone, fortunes have been spent in hydro-electric developments and upon the completion of developments projected or now under construction, the expenditures will have mounted fifty million more and the developed horsepower will be practically sixty per cent of that available in the State. While there is a limit to this resource to which the economic situation sooner or later will push development, it is far in the future and in the meantime there are due many changes in application, utilization, and demand which put the vista almost beyond conjecture. However, not only the tremendous asset of power from water impounding has presented itself, for as the ever-present thorn there is also a derogatory side which has claimed no small share of attention, which continues to loom as a tremendous liability and persists in engendering grave concern.

The early impounders apparently were unaware of any health hazards contingent upon their projects. Available pond sites were dammed and filled, capacity for power being the interest. No concern was felt about the condition of the basins. Whole forests were flooded or partly inundated without a guess of evil days to come. Powerhouse wheels then spun busily on while malaria mosquitoes availed themselves of these newly-prepared and excellent breeding grounds. Thus, in connection with impounding for hydro-electric development, the malaria problem grew, and in the form of a lawsuit—Chattanooga & Tennessee River Power Company vs. Lawson—in the Tennessee courts, 1915, announced itself as a momentous issue.

To the present, lawsuits tried and pending in the South have involved millions of dollars in addition to fees and costs. One power company at one time had six hundred suits pending against it, each for \$3,000.00, a total of \$1,800,000.00. Together with the costs of war, North Carolina has been the battleground for sums commensurate with her position in the power field. The liability in health hazards and the uneasiness injected into the progress of a key industry cannot be estimated. There are sections of the State for which progress awaits only until health conditions are brought up to standard. Also, there are instances in which industries have been turned away from the State because of the unavailability of suitable power.

Another view of the situation is presented in our courts. Juries are called upon to settle claims for malaria damage. Malaria has existed before the present era of impounding, oftentimes in the community in which the impounding is done. Defendants are not responsible for this. Plaintives contend that impounders have created or intensified these conditions. Conclusive facts often have been wanting. The dilemma of a jury left to settle the issue upon evidence which is largely a matter of greatly-differing opinion is obvious. Neither the jeopardizing of health through impre-

cautions or lack of foresight nor the persecution of those in a position to make available our natural resources can be condoned. The availability of more definite information regarding the mosquito and malaria condition in a locality both before and after impounding would greatly facilitate the clearing up of difficulties.

More preferable, however, than the settling of controversies would be the elimination of their causes. This bespeaks the need of knowledge which will go further toward the elimination of health detriments in the maintenance of power ponds. Much has been done already. No more ponds are found rising in uncleared forests. Old ponds have been cleared, and the practice of keeping all of them clean and of discouraging mosquito breeding is general. However, amidst a condition of uncertainty there has arisen a desire for more knowledge in handling mosquito and malaria conditions, better and surer methods of control, and some level of conduct and understanding which will reduce health hazards to a minimum, command the approval of fair-minded people, and better put the hydro-electric industry upon the road of progress with the good-will of all concerned. In these problems and controversies the State has a responsibility, an obligation, a stake for loss or gain.

It is true that a state best promotes its interests by fostering industries and even truer is this in the safe-guarding of the health of its people. Solving the problems outlined is progress in promoting such interests.

Purpose of Studies

Industries naturally follow in the wake of power development and can thrive only in proportion as the power interests prosper. Power growth has come more and more to center around water developments and likewise has the malaria problem centered. The work and development of the U. S. Public Health Service gave hydro-electric projects their living chance. This was excellent headway, but there is yet much to be done in carrying on that work. While the present knowledge is generally applicable and makes possible the contingent interests, each project has an individual equation upon which much of its prosperity may depend and which to know is highly desirable. As with railroads and other organizations in whose welfare malaria has been discovered to play a part, impounders may desire to gain the asset accruing to the improving of health conditions and the gaining of good-will among those whom they may benefit, but this is not incumbent upon them. However, all are concerned in knowing that conditions, if not improved, remain at least unchanged. This is another call for facts resultant of which there has arisen an urgent need for the study of mosquito and malaria conditions in connection with North Carolina industries. Power officials are deeply concerned with it, and in addition to maintaining their own forces for control work on ponds already in use, they are much interested in work carried on by the State.

These problems in the State were given cognizance and a program instituted with the following purposes in view: to further determine the effect on mosquito and malaria propagation from damming water-courses, to determine the variation in species breeding because of changing from flowing streams—the natural haunts in the South of *Anopheles Punctipennis*—to sluggish streams and ponds—the natural breeding places of *Anopheles Quadrimaculatus*, the principal carriers of malaria; to ascertain and perma-

nently record conditions surrounding impounded water projects before and after impounding; to work toward the future elimination as far as possible of the mosquito and malaria problem. A brief consideration of breeding habits and the effect of surroundings and changes may give something of the outlook of the undertaking.

Differential Breeding

The breeding habits of the different species of mosquitoes are an important consideration in the impounding of water, and is the factor that threatened to bring to grief the first water-power projects in the South. While the whole mosquito family is given with variable adaptability, each species has a marked preference for waters of particular characteristics. This is so pronounced that the type to be found in different situations can be forecast with fair accuracy. Preference with most species is for natural instead of artificial collections of water. However, when both are present this may often mean a greater extent of breeding in the natural, than in the artificial ones, rather than all breeding in one and none in the other. In all cases quiet and protection are essential for propagation. Absence of trash, weeds, grass, or other obstructions, or the presence of wave and ripple action are strong deterrents to production.

Of the *Anopheles*, the *Quadrимaculatus*, or principal malaria carriers, breed in ponds, lakes, pools, lagoons and estuaries, sluggish streams and tubs and cans. Marine growth, floatage, and moderate stagnancy only add to their comfort. Organic acids such as tannic, any kind of filth as excreta or waste, or contaminations of a chemical nature tend to discourage them. Appreciable quantities of any of these will stop their breeding altogether.

Anopheles Crucians tend to begin breeding where *Quadrимaculatus* leave off. The inclusion of minerals such as found in brackish water, or swamp and bog water containing tannic acid proves attractive to them. These attributes with a nature akin to *Quadrимaculatus* for peaceful water, tend to locate this group in lowlands and flat country. They therefore may be on the scene in malaria epidemics.

Punctipennis is the free-water active stream group of the *Anopheles*. They are to be found harbored along running streams, springs, branches, and not infrequently in springs. They are more adaptable to both temperature and environment changes than the other species, upon necessity will resort to various departures from their choice of waters, and therefore, are the more widely distributed.

It is hilly country with pronounced fall that affords the best impounding sites. Any kind of condition may exist on a small scale in such an area, but in whole it is one of springs and briskly moving water-courses, and therefore, the haunts of *Punctipennis*. Though this species can be infected with malaria it has not been proved infective in nature and disease carrying has not been generally charged to them. When such an area as they inhabit is impounded and the flowing water replaced by relatively still water, they may tend to lose interest and wane in their breeding while *Quadrимaculatus* thus favored will begin intensified activities which, if not controlled, soon will reach unhealthful proportions. Even though the adaptability of the *Punctipennis* may continue them in unabated numbers, it can be dependably relied upon that, left to their own volition, *Quadrимaculatus* will be added to the mosquito population evolving from such

changes. Thus, from the nature of the insects, the hazard of malaria is incurred upon impounding.

Other factors of prime importance in the control of mosquitoes in impounded waters are sanctuary and natural enemies. To utilize a location for breeding, mosquitoes must find in it more than favorable water conditions. Sanctuary from agitating elements and enemies are essential. If an otherwise favorable body of water is free of trash, floatage, and vegetation, and is open to wind and wave action, mosquito larvae do not thrive in it.

The mosquito realm in all three stages is inflicted with numerous predacious enemies—fish, birds, insects, parasites, plants, reptiles, and even their own cannibalism. It is possible to utilize these natural enemies in the control of mosquitoes. One of them, a small surface minnow—*Gambusia Affinis*—has been used extensively in ponds. However, conditions must be suitable to their abilities and habits or the purpose is defeated. Any material such as growth or trash and floatage will offer mosquito larvae sanctuary and bar access to the minnows.

In addition to these considerations there are other factors such as geology, topography, and climate which exert direct influence on a mosquito situation and offer extended avenues of study. In the work on impounded water, these were gone into extensively, however, any comprehensive treatment of the subject is too extensive for space here.

Methods and Procedure

Studies of impounded water projects were carried on in the form of surveys. A feature of the work was coöperation between the State Board of Health and county health organizations in whose territory the work was carried on. The general data collected was histories of past occurrences of malaria, present malaria both by history and by taking blood tests, and general premises conditions which pertain to mosquito favorability. These constitute an index to the prevalence of malaria, past and present. Also a general mosquito survey of the territory is made with a view of determining the kind and prevalence of mosquitoes. This finds service in correlation with existing malaria conditions as well as showing potentialities and also as a basis for future comparison.

The territory of immediate interest for study is that within a one mile range of the territory of impounding, this being considered the probable extent of effect from a breeding area. When such an area has been laid out, workers proceeded from house to house. The purpose was explained and then through a series of questions, blanks arranged for the desired information were filled out. In addition blood smears were taken as follows: The tip of a little finger was thoroughly cleaned with alcohol, and while being gripped to cause congestion, was quickly punctured with a needle. The first drop of blood was wiped away, the second drop was picked up with an end edge of a clean slide, placed on the face of a second slide near one end, allowed a moment to spread across their widths, and with the first slide held at 45 degrees to the face of the second, was quickly smeared along two-thirds of this surface. Such a smear dries very rapidly. The serial number of the person being examined is then written with lead pencil directly into the smear. Slides were then returned to container for safe-keeping. Daily they were brought into the office, wrapped in tissue paper, and filed to await examination.

Completing the blood smear work was as follows: Wright's stain, secured already prepared, was used for staining. The method given for preparation and use was—"Stock solutions; dissolve two-tenths grain dry stain in 120 cc of acetone-free methyl alcohol, store in a light-proof bottle. For staining, filter 20 cc stock solution, dilute with 5 cc acetone-free methyl alcohol. With slide lying flat apply small amount of stain with medicine dropper, let remain for one and one-half minutes, add distilled water, allow to stand for three or four minutes; rinse with distilled water and permit drying." Slides are then ready for examination.

Examinations were made on a movable stage microscope, oil immersion. Detail of identification will not be gone into here. After twenty minutes of careful scrutiny, unless findings were otherwise, smears were passed up as negative. Results were then duly recorded.

Mosquito Conditions

In surveying for mosquito conditions in areas as large as those involved in the present day impounding project, the application must be shaped in a manner to best secure the desired results and still be within range of practicability according to personnel available for it. The method in general is to size up the territory carefully, spot a maximum number of producing areas, choose from these the apparently more significant, in quantity within range of practicable application, and then visit them by regular schedule, seeking out the desired breeding and prevalence date and recording in collective forms. The date thus compiled constitutes a permanent record in cross-section of the areas under surveillance. Good maps are very useful and time-saving in planning and getting the work under way.

In following the plan laid out, field notes are compiled carrying data of apparent value. Such mosquitoes and larvae as are taken are labeled and reserved to later be identified and results entered on the records started in the field. Thus is gradually compiled a continuous portrayal of transpirations through a season.

Field equipment is simple, consisting of insect-catching apparatus and containers for storing until catches are identified. Identification is done both microscopically while the insects are in the larvae stage and by maturing and identifying adults.

Recording is a highly essential feature and demands careful attention, for the permanent value of the work rests thereon.

Studies on impounded waters were made on three projects: The High Rock Project of the Tallassee Power Company, Davidson, Davie and Rowan counties; Lake Lure, Rutherford county, and the Norwood project of the Carolina Power & Light Company, Stanly and Montgomery counties.

The data collected on these projects is within itself of quantity sufficient to form a volume. Only collective results in outline are given here.

The High Rock Project

The High Rock Project, under construction at the time of this report, is one of the twenty major hydro-electric power developments producing from 500 to 93,000 horsepower per unit, wholly or partly within North Carolina and is one of the five in the State promoted by the Tallassee Power Company. To the 216,000 horsepower now being developed by the company in the State, this project is planned to add 45,000, which, by contract stipulating delivery of current by the first of 1928, is consigned wholesale

to the Southern Power Company which will market it for industrial or general use locally or broadspread as the demand may arise.

The project is located on a twenty-three mile section of the Yadkin river, occupying an area from the dam and powerhouse site at High Rock Mountain eighteen miles east of Salisbury; along the territory of the common border of Davidson and Rowan counties, upstream, northwest, touching Davie county on two sides by branching into the South Yadkin river for eight miles.

Figures given for the lake and dam are as follows: dam, 59 feet high, 1,200 feet long; lake 19,000 acres or 20.7 square miles in area, 300-mile shore line, to back water 23 miles.

The mosquito surveys on this project were carried on through two seasons—1926 and 1927. The history and blood work was terminated in the first year. Work of this type on a large project is voluminous and in many respects subject to the difficulties that go with the organizing of temporary forces of limited personnel for such work. Due cognizance is taken of this and results evaluated accordingly.

Malaria in the High Rock Territory

History and blood indices disclose that for the period embraced by the 1926 survey in the High Rock territory, malaria as compared to districts in which the disease becomes a major problem, was not a feature of public health importance. The infections as shown by histories was 1.78%, by blood smears, 3.50%.

It is well, however, for those interested in malaria and malaria control to remember that the problem is a constantly shifting and fluctuating one and that it is practically impossible to secure a picture of the disease at rest, nor is it expected that the parasitic or history indices will remain the same for long periods of time. Sectional differences, in view of the disease and toleration for it, will have influence. Also, the experience gained in one community may be entirely contradicted by that from another of similar type.

Mosquitoes in the High Rock Territory

The outcome of the mosquito survey in the High Rock territory amply meets any normal expectation that may have been held for it. Both *Culex* and *Anopheles* existed in proportion as they were afforded sanctuary and favorable conditions.

Culex were generally prevalent in limited quantities throughout the territory, with exaggeration in sections when afforded fitting encouragement such as conditions of water contamination by rubbish, waste, or sewage. This was given expression in the increase in prevalence during dry seasons.

Punctipennis existed in by far the greatest quantities, which marks the section as majorly *Punctipennis* grounds. This measures up to original appearances, that at large the section topographically was fitted best to the production of this type of mosquito.

Quadrimalatus existed in limited quantities and were fairly well distributed under general conditions throughout the territory. They appear prominently where efforts were confined to territory of the type most suited to them. This again supports original indications, that while the territory was by nature majorly of *Punctipennis* producing proclivities, it also would be subject to local *Quadrimalatus* production. The presence

of this type of mosquito in its typical haunts and its general reaching out to avail itself of other points of favorability again brings out its nature and bespeaks the very immediate probabilities of its course where the effectiveness of the territory's natural topographical barrier to them is voided without substitution. That these mosquitoes have made themselves felt is demonstrated by the history and parasitic indices.

Density in whole followed a normal course in rising to a maximum in October and then declining, the whole course showing the response to weather and topographical conditions that is imposed by these circumstances. The peak of malarial infection is normally reached in the latter part of September or during October.

The types of mosquitoes present existed in quantity and distribution sufficient to register a general, timely response to any development that favored them. The foci are present and the mosquito population has demonstrated its readiness to follow a perfectly normal course in the territory so far as permitted. It is to be expected that they will expand into any avenue open to them.

The Lake Lure Project

Lake Lure, a project of the Chimney Rock Mountains, Inc., Chimney Rock, N. C., is a mountain resort development planned to cost approximately four million dollars. It consists of 8,200 acres or 12.8 sq. mi. of mountain and valley land, 1,500 acres or 2.4 sq. m. of which serves as a basin for the lake created by the construction of a concrete dam 574 feet long, carrying a 104-foot head.

Its location is on the Broad or Rocky Broad river in Rutherford county, approximately half way between Rutherfordton and Asheville. State road maps give the distance between these towns as 47 miles. The development is approximately 18 miles west by north from Rutherfordton.

Malaria in the Lake Lure Territory

History and blood indices disclose that for the period embraced by the 1926 survey in the Lake Lure territory malaria was not of special sanitary importance. Infections as shown by histories for natives was 1.97%, for transients, 3.63%: total, 3.25%. By blood indices it was 3.29% for natives and 2.78% for transients, a total of 2.89%.

As in the High Rock territory, malaria, while present, was not prevalent in quantity to be considered a public health problem. Its presence in a mountainous area has its points of interest. Two classifications were made in the residents involved in this work. Those who had not resided long enough to make the local contraction of malaria possible are classed as "transients," while those who had resided in the locality for a length of time equivalent to that required for the transmission of malaria under prevailing conditions were classed as "natives." According to histories, infection among natives was 1.97%, for transients 3.63%. Blood indices were: natives 3.29%, transients 2.78%.

Mosquitoes in the Lake Lure Territory

Summarizing the mosquito situation in the Lake Lure territory, *Anopheles Punctipennis* was the predominating species in constant prevalence. The density and distribution of these may be considered normal according to the territory. *Anopheles Quadrimaculatus* were present but during the

first year's work showed a sparsity not reconcilable with malaria conditions. However, the second year's work brought out evidence of a density compatible with conditions. *Culex* mosquitoes were present in varying quantities according to fluctuation of favorable breeding locations. Since this variety is a contaminated water breeder, its prevalence is effected to a great extent locally by man-created conditions. The significant thing about this situation is its contradiction of the generally prevalent opinion regarding the presence of mosquitoes, especially the malaria carriers, in mountainous sections.

Norwood Project

The Norwood project of the Carolina Power and Light Company is located on the Yadkin river and extends from the dam adjacent to the town of Norwood upstream to the Uharie river, a distance of approximately twenty miles comprising a lake of 5,294 acres. It is one of the major developments of the State.

Mosquito surveys were made on this project through one season with a showing of what may be termed a normal mosquito production according to expectation. This may seem to be a somewhat indefinite disclosure, however, in the absence of any standard of measurement or comparison this with the further qualification that may be gotten from survey records is the only dictatory means of setting forth the condition. Both *Culex* and *Anopheles* mosquitoes were prevalent about the territory, the latter in all three species—*Quadrifasciatus*, *Crucians*, and *Punctipennis*. *Anopheles Crucians* were present only in limited quantities. *Anopheles Punctipennis* was the prevailing type which is characteristic of positively delivitous country with active streams. There was, however, sufficient departure from this condition to produce in appreciable quantities *Anopheles Quadrifasciatus*, the malaria carrier of primary sanitary importance. This was sufficiently pronounced to spread malaria in one section to epidemic proportions. A significance of the presence of this type of mosquito is that it demonstrates their ever-readiness to utilize the smallest turn of favorability and what may be expected of them if undeterred when thousands of acres of favorable breeding water is left at their disposal.

Resurveys

While intensive studies on impounded waters were discontinued after the basins of the lakes were flooded, attention to them was not discontinued. Follow-up surveys were made at intervals in order to check up on developments and to discover any undesirable trend that it might be headed off early. This is especially valuable in the interests of health and also to the promoting interests. It is very difficult to estimate what turn of affair may develop in a new pond before it has bedded down and reached stable conditions. Here these resurveys are especially valuable in serving the purpose of health work. These surveys vary from those of the studies in that they are a specific application to a given condition such as sampling or trouble spotting.

Surveys of Towns

Surveys of towns may follow various courses according to their demands in clearing up mosquitoes and mosquito borne diseases. They often may go on for years tolerating a mosquito condition until attention is focused

on it by the spread of disease, by development, renewed civic pride, and similar means. For instance, the gradual growth of a town may slowly intensify a sewerage contamination condition which later announces itself by the presence of pestiferous mosquitoes in intolerable quantities. Such a condition came about in Thomasville and was marked by uncertainty because of the want of facts regarding it. Proper surveys by the State Board of Health brought out these facts and the situation was handled accordingly.

In some towns the campaigns have been against malaria mosquitoes, in others against the combination of malaria and pest mosquitoes. The latter course, as is apparent, is the logical procedure, for by it more hazards are eliminated and a greater level of comfort established. For instance, the idea of yellow fever or dengue fever are well removed from the minds of the average citizen, however, the vector of both—the *Aedes aegypti* or *Stegomyia fasciata*—is prevalent in many towns and in instances plentiful, and the absence of carriers of the diseases is the controlling factor.

Salt Marsh Surveys

During recent years the salt marsh mosquito has attracted more and more attention. These mosquitoes have always existed along the coasts, but there are probably two factors which are forcing attention. The idea that this mosquito is on an increase is debatable in the absence of positive proof. However, the gradual changing of coastal topography may be creating added favorability to their production. It is a fact that progress and development are taking courses which are blocked by salt marsh mosquito condition and herein lies the impetus of increased agitation. People will go through most anything to get to the water. Mosquitoes do not stop them, but loud protests are voiced at sharing the watering places with mosquitoes. Mosquitoes serve as an effective dampener to the varied business and pleasure interests which evolve about the waters on the coast of the State.

In answer to the demands for attention, Congress has been making appropriations for surveying salt marsh areas along the Atlantic Coast and in the Gulf states. While the migratory nature of the salt marsh mosquito creates an interstate problem, the states have their interests and it was in keeping with these interests that the North Carolina State Board of Health went into the surveys conjointly with the U. S. Public Health Service. About two months of the summer was spent in surveys of salt marshes in the State by State and Federal forces. This was the beginning of what is hoped may be some solution of the salt marsh mosquito problem. The work marks another move of the State Board of Health in safeguarding health and promoting prosperity.

BUREAU OF MATERNITY AND INFANCY

The Bureau of Maternity and Infancy is financed jointly by the State and Federal Governments. It functions coöperatively with the Children's Bureau of the U. S. Department of Labor.

BUREAU STAFF

A whole-time Medical Director, Director of Nursing Service, Secretary-Stenographer, and Clerk.

FIELD STAFF

Four field advisory nurses paid entirely from Bureau funds and twenty county nurses paid jointly by Bureau and County appropriations.

PLAN OF WORK

The plan of operating is comparatively simple. First, financial assistance is given a county to employ at least one nurse, whose duties are limited to maternity and infancy work in accordance with plans approved by the Bureau. If a county employs several staff nurses, the maternity and infancy work may be apportioned among them as a part of a generalized nursing program, but in no case does the Bureau appropriation exceed the fixed amount necessary to pay one-half of the expense of one whole-time maternity and infancy nurse.

Second, the Bureau provides personal service without cost to the county to assist in the training of personnel, the development of a systematic service and the establishment of standard routine methods. This personal service is also available to counties or individual communities that desire to undertake some particular project of maternity and infancy work in connection with a general program of health work and is likewise extended to various unofficial agencies in areas not having any sort of organized health service.

DIVISIONS OF SERVICE

There are four major divisions of service:

1. Midwife Control and Instruction.
2. Prenatal Care.
3. Infant Care.
4. Care of the Preschool Child—2-6 Years.

METHODS

Three methods are used in the work of the four major divisions of service enumerated:

1. Conferences or clinics.
2. Special demonstrations.
3. Home visits.

I. Midwife Control and Instruction

By adoption of the Model County Midwife Regulations, local health authorities have direct control of midwife practice. These Model Regulations provide essentially that the midwife shall undergo physical examination to detect dangerous communicable diseases and shall attend classes

to receive instructions and demonstrations given by doctors and nurses in the conduct of a normal case of labor. Upon satisfactory completion of the course she is given a permit to practice. This permit must be renewed annually.

To assure compliance with rules and regulations, check-up classes are held periodically and visits are made by the nurse to the homes of the midwife to investigate domestic conditions, discuss cases and to see that midwife equipment is kept in good condition. Case visits are occasionally made by nurse with the midwife to observe technique and practice.

The Model Regulations have been adopted and the standard course of instruction given in 29 counties. Numbers of other counties and cities have similar regulations and courses of instruction but these are not included as a part of this report. In the aforementioned 29 counties more than 2,500 midwives were practicing and less than half were given permits to continue practice.

II. Prenatal Care

In addition to 209,681 pieces of literature distributed on prenatal care, and 9,650 complete sets of monthly instructive letters (nine in number), mailed to expectant mothers, definite progress has been made in the organization of prenatal conferences with demonstrations and follow-up home visits.

Permanent prenatal conferences with local physicians in attendance are conducted weekly in Mecklenburg and Wayne counties. Halifax county has similar conferences with nurse in attendance to inspect patients, take blood pressure, and make urinalysis. At these conferences the patient is not only examined, instructed and advised, but a complete inexpensive maternity layette is displayed and its use demonstrated. A complete set of infant's garments are available and the dressing and general care of young infants demonstrated.

III. Infant Care

For convenience of discussion as well as for clearness, Infant Care, and Care of the Preschool Child—2-6 years, were outlined separately. However, in the routine child health conferences, no such distinction is made and both infants and preschool children are admitted and examined. The special conferences for the preschool child exclusively will be discussed subsequently in connection with the cooperative plan for physical examination of children before entering school for the first time.

The infant and child health conferences or clinics are conducted to make a physical examination as completely as can be done in clinics of this character. The physicians conducting the clinic advise the mothers as to general hygienic and dietetic management. The attention of the mother is directed to any defects found and she is advised as to their correction. Communicable diseases and methods of preventing them are discussed. These conferences are a part of the regular routine in twenty counties and itinerant conferences are held elsewhere at irregular intervals in cooperation with voluntary agencies. The number of children examined and the defects corrected as a result of these examinations will be found in the special statistical table.

In addition to these routine child health conferences, special infant feeding demonstrations were conducted in Richmond and Forsyth counties to

demonstrate two things: First, the value of scientific infant feeding, and, second, the value of coöperation between health nurse and private physician.

Twenty-five undernourished infants were selected in Richmond county and one hundred in Forsyth county. The nurses made weekly visits to each case, maintained regular contact with the physician in charge, and the mothers in turn carried their babies to physicians at monthly intervals and more often if conditions indicated. More than 95% of these babies approximated normal weight or showed definite improvement before discharge and the project has been repeated each summer in these two counties.

IV. Care of the Preschool Child—2-6 Years

The child between these ages is usually given less attention than either the infant or the school child. This neglect is most noticeable when the child enters school physically unfit and unprotected from smallpox and diphtheria.

In coöperation with the State Board of Education and State Parent-Teachers' Association, this department began an organized effort January 1, 1928, to get all health departments and other interested agencies to undertake the examination and immunization of children approximating school age. The plan adopted was that the local health department, local board of education, and local parent-teachers' associations assume joint responsibility for securing a survey and census of the children between five and seven years of age. Later these three agencies coöperatively conducted clinics for physical examinations and protection from smallpox and diphtheria. Incomplete reports to date show that 7,852 children were examined. Every effort will be made to follow up these children at a later date to determine the number of physical defects corrected as a result of these examinations.

When approximately 45% of the first grade pupils of the State fail to be promoted, the question of physical defects as a cause becomes uppermost in mind. It was with this condition in mind that the three interested agencies combined in the attempt to establish in the minds of the parents of North Carolina the idea of making physical examination and immunization of their children a part of the routine preparation for school entrance.

ADMINISTRATION OF TOXIN-ANTITOXIN TO THE PRESCHOOL CHILD

Realizing that approximately 75% of the deaths from diphtheria occur in children of preschool age, this department coöperated with the Department of Epidemiology to demonstrate the possibilities and effect of intensive methods in getting children of preschool age protected from diphtheria by use of toxin-antitoxin. Pitt and Edgecombe counties were selected. These counties are adjacent, present similarities in many respects, and are therefore comparable. A house-to-house canvass was made by townships and the children of preschool age enumerated. Follow-up clinics were held. The work in Edgecombe county is not yet completed, but the figures from each township completed in both Pitt and Edgecombe reveal that approximately 60% of the preschool children enumerated in the survey or canvass reported at clinics for toxin-antitoxin treatments.

Statistical Report

Prenatal and Child Conferences Conducted by Physicians:

Number of Conferences (group and individual)	5,595
Number Expectant Mothers Registered	4,012
Number Expectant Mothers Examined	4,012
Number Infants and Preschool Children Registered	18,262
Number Infants and Preschool Children Examined	18,262
Defects Corrected in Children Examined	1,572

Health Conferences Conducted by Nurses:

Number of Conferences (group and individual)	4,530
Number Children Inspected	9,103
Number Mothers Instructed in Prenatal Care	3,505
Number Visits by Children	11,583
Number Visits by Mothers	5,244

Midwife Classes:

Number Midwives Taking Course	1,609
Number Midwives Given Permits (Six classes in course.)	1,513

Home Visits:

To Prenatal Cases	13,062
To Postnatal Cases	7,340
To Infants	30,301
To Preschool Children	11,642
Unclassified	1,859
Total Number of Visits	65,514

Immunizations:

Diphtheria	11,520
Smallpox	11,864
Typhoid Fever	790

Talks and Lectures to Mothers in Group Conferences	9,784
Total Pieces of Literature Sent (exclusive of prenatal letters)	209,681
Complete Sets of Prenatal Letters Sent	9,650
Boxes Silver Nitrate Solution 1% Distributed	28,124
Number Pamphlets on "Breast Feeding" Sent	11,885

Total Number Cases Reached Through Work of Bureau:

Prenatal Cases	24,833
Infants	50,318
Preschool Children	40,612

BUREAU OF COUNTY HEALTH WORK

During the biennium financial assistance has been extended to forty counties to assist in maintaining county health departments to promote and protect the health interests of the respective counties.

The counties with their respective budgets, expenditures, and cost equivalent earnings in service rendered are shown in the following table:

County Budgets, Expenditures, and Cost Equivalents Earned

<i>County</i>	<i>Budget</i>	<i>Expenditures</i>	<i>Cost Equivalent Earned</i>
Beaufort	\$ 13,567.43	\$ 15,468.83	\$ 21,880.09
Bertie	10,626.42	11,295.62	25,272.65
Bladen	14,067.89	10,829.85	12,959.79
Brunswick	11,191.99	17,639.35	35,073.21
Buncombe	39,136.41	31,108.85	70,459.75
Cabarrus	23,966.19	21,051.46	39,989.05
Carteret	6,250.00	11,105.54	13,954.80
Columbus	10,549.67	10,587.99	15,894.55
Craven	16,940.75	16,939.90	32,577.44
Cumberland	17,280.20	16,975.92	30,643.93
Davidson	18,189.83	17,227.82	27,794.87
Durham	94,525.80	101,004.65	215,489.42
Edgecombe	15,231.91	18,276.44	36,214.42
Forsyth	53,840.54	62,602.82	139,819.87
Gaston	2,083.32	2,666.64	6,424.92
Granville	16,996.51	14,590.07	32,261.34
Halifax	19,816.28	20,425.71	32,942.45
Henderson	11,406.33	* 12,550.21	32,454.88
Johnston	10,624.25	10,036.71	27,765.25
Lenoir	20,564.75	22,787.69	43,703.37
Mecklenburg	22,425.71	23,897.77	59,595.35
Moore	2,083.33	2,887.79	7,150.42
Nash	10,210.75	12,539.21	23,099.81
New Hanover	62,627.50	78,364.74	113,985.08
Northampton	12,296.93	9,627.01	13,741.95
Pamlico	8,256.22	8,156.89	14,455.41
Pitt	18,015.72	20,233.17	41,394.33
Randolph	5,000.00	4,581.85	9,532.60
Richmond	11,164.18	14,757.01	32,245.45
Robeson	13,220.80	18,503.43	29,049.19
Rowan	20,509.22	38,080.17	67,347.35
Rutherford	11,694.66	10,535.34	19,127.82
Sampson	10,033.84	9,982.33	20,462.80
Surry	14,420.11	14,596.24	39,035.26
Transylvania	2,500.00	2,710.29	2,739.85
Vance	14,161.80	12,663.17	24,803.40
Wake	65,799.18	63,067.48	133,074.76
Wayne	35,171.70	34,554.43	100,836.06
Wilkes	11,271.57	9,085.47	11,672.35
Wilson	17,517.51	16,807.90	31,862.00
Total	\$774,672.45	\$850,803.56	\$1,688,787.29

The combined work accomplished in the forty counties is shown in the following table:

I. COMMUNICABLE DISEASE CONTROL

	Number	Unit Cost	Cost Equivalent
1. CONTAGIOUS DISEASES:			
Quarantine by mail	19,827	\$ 0.50	\$ 9,913.50
Quarantine by visit	92,489	1.50	138,733.50
Visit to and instruction of schools	9,638	2.00	19,276.00
Instruction of schools through teachers	6,618	1.00	6,618.00
Epidemiological investigation	31,393	1.50	47,089.50
Vaccination, smallpox	146,138	.25	36,534.50
Vaccination, typhoid, complete	195,650	.50	97,825.00
Vaccination, diphtheria, complete	68,561	.75	51,420.75
Vaccination, pertussis, complete	6,248	.50	3,124.00
Schick Test	48,142	.50	24,071.00
Dick Test	966	.50	483.00
Lecture Course, number attending	19,157	.10	1,915.70
2. VENEREAL DISEASE CONTROL:			
Cases reported	7,941	.25	1,985.25
Treatments, indigent cases	60,142	2.50	150,355.00
Cases returned for treatment	269	4.00	1,076.00
Mercurial inunction	289	2.00	578.00
3. TUBERCULOSIS CONTROL:			
Cases registered	1,366	.25	341.50
Tuberculous homes visited and instructed	11,736	1.00	11,736.00
Organization, clinic, number examined	8,316	1.00	8,316.00
Examination, tuberculosis	7,198	1.00	7,198.00
Admission to tuberculosis institution	693	5.00	3,465.00

II. HYGIENE

1. INFANT AND MATERNAL HYGIENE:			
Prenatal cases registered	7,827	.25	1,956.75
Babies registered	24,263	.25	6,065.75
Home conferences, mothers	72,399	1.00	72,399.00
Individual or group conferences, mothers; No. present	32,269	.25	8,067.25
Women completing standard course	484	3.00	1,452.00
Midwives completing 6-hour course	1,622	4.00	6,488.00
Children certificated, Little Mothers' League	453	3.00	1,359.00
2. SCHOOL HYGIENE:			
Tonsil and adenoid operations	7,006	5.00	35,030.00
Children treated, dental defects	50,995	2.00	101,990.00
Refractive errors corrected	2,009	1.00	2,009.00
Orthopedic corrections	1,482	5.00	7,410.00
Nutritional correction	6,341	1.00	6,341.00
Pages, Modern Health Crusade	8,278	.25	2,069.50
Examinations, school children, inc. preschool ages 2-6:			
Primary	202,003	.25	50,500.75
Final	80,367	.50	40,183.50
Excluded from school, account of scabies	3,643	.25	910.75
Excluded from school, account pediculosis	2,167	.25	541.75

III. MEDICAL AND LABORATORY SERVICES—MEDICAL

1. VISITS:			
Jail	8,349	1.50	12,523.50
Convict camp	4,867	1.50	7,300.50
County home	9,088	1.50	13,632.00
County tuberculosis hospital	1,342	1.50	2,013.00
Hookworm treatment	1,536	.25	384.00
Anti-rabic treatment, complete	231	10.00	2,310.00
Consultations, professional	404	1.50	606.00

		<i>Unit</i>	<i>Cost</i>
	<i>Number</i>	<i>Cost</i>	<i>Equivalent</i>
2. EXAMINATIONS, SPECIAL:			
Prisoners	14,632	1.00	14,632.00
Marriage	8,580	1.00	8,580.00
Teachers	8,797	1.00	8,797.00
Child for industry	8,430	.50	4,215.00
Food handlers	6,613	1.00	6,613.00
Examination by court order	693	2.00	1,386.00
Admission to institution	1,716	1.50	2,574.00
For lunacy	1,385	2.00	2,770.00
Life extension	11,969	2.00	23,938.00
Postmortem	145	5.00	725.00
Coroner's Inquest	12	5.00	60.00
LABORATORY WORK			
Specimens sent to State Laboratory	24,042	.50	12,021.00
Throat culture and examination for diphtheria bacillus	7,841	1.50	11,761.50
Feces examination for parasites	984	.50	492.00
Sputum examination for tuberculosis	549	1.00	549.00
Blood for malaria	3,469	1.00	3,469.00
Pus for gonococci	1,181	1.00	1,181.00
Complete urine analysis including microscopic exam.	11,823	1.00	11,823.00
Albumen test, prenatal cases	2,931	.50	1,465.50
Milk analysis	12,239	2.00	24,478.00
Babcock test alone	3,030	.50	1,515.00
Water analysis (public supply)	8,145	1.00	8,145.00
Examination, rabies .....	.....	1.50	22.50
Wassermann tests .....	.....	1.50	219.00
Throat swabs .....	.....	.50	1,303.50
IV. SANITATION			
1. EXCRETA DISPOSAL:			
Urban privies constructed or repaired	16,397	.50	8,198.50
Sewer connections	7,094	2.50	17,735.00
Rural privies constructed or repaired	9,016	5.00	45,080.00
Urban privies, licensed	2,771	.....	1,385.50
2. PRIVATE WATER SUPPLIES:			
Protected against surface pollution	323	5.00	1,615.00
3. ABATEMENT OF NUISANCES:			
Minor	55,732	.50	27,866.00
Major, hours spent	13,264	1.00	.....
V. FOOD CONTROL			
1. INSPECTIONS:			
Dairy	12,290	1.00	12,290.00
Abattoir	3,669	1.00	3,669.00
Hotel, restaurant, market	79,232	.50	39,616.00
2. EXAMINATIONS AND TESTS OF ANIMALS:			
Ante mortem (when temperatures are taken)	6,092	.25	1,523.00
Post-mortem, viscera attached	113,297	.25	28,324.25
Cows tuberculin tested by veterinarian employed by health department	8,981	1.50	13,471.50
VI. MISCELLANEOUS			
1. CONFERENCES, HEALTH OFFICER:			
Office conference by health officer	52,951	.50	26,475.50
Official group (including meeting of Board of Health and County Commissioners)	2,270	1.50	3,405.00
2. CONVICTIONS:			
Violation of health laws	935	5.00	4,675.00
VII. TRANSPORTATION			
1. MILEAGE (OFFICIAL BUSINESS):			
Car—miles	1,989,450	.10	198,945.00
Health officer—miles	763,691	.05	38,184.55
Nurse—miles	884,064	.03	26,521.92
Sanitary inspector—miles	399,755	.03	17,992.65

BUREAU OF MEDICAL INSPECTION OF SCHOOLS

During the current biennium the work of this division has been directed by the State Health Officer, and has been conducted along the same lines that past experience has proved to be sound in principle and practice.

Under the State laws medical inspection must be done in every county at least once in each three years. During the biennium this inspection work has been done in the following counties, totaling forty-nine: Alamance, Bladen, Burke, Caldwell, Camden, Caswell, Catawba, Cherokee, Chowan, Clay, Cleveland, Columbus, Currituck, Dare, Davis, Duplin, Gaston, Gates, Graham, Greene, Halifax, Harnett, Haywood, Hertford, Hyde, Jackson, Jones, Lee, Lincoln, Macon, McDowell, Onslow, Orange, Pamlico, Pasquotank, Pender, Perquimans, Person, Polk, Rockingham, Scotland, Stanly, Swain, Transylvania, Tyrrell, Union, Washington, Warren, Yadkin.

This inspection work was carried on by a staff of seven experienced school nurses. A total of 2,147 schools were visited and 135,533 children were weighed, measured and checked for defects of eyes, ears, nose, throat, teeth, orthopedic and nutrition. Defects were found as follows: hearing 2,103, vision 18,347, throat 65,851, teeth 56,772, nutrition and all others 19,982. In each case notice was sent to the parents advising of the findings of the school nurse and urging that the child be given prompt and proper medical or dental care, or both, as indicated.

As a further follow-up towards securing the remedying of discovered defects clinics for the operative treatment of diseased tonsils and adenoids were conducted in thirty-six counties with a total of 3,612 children receiving needed treatment, the counties being Alexander, Anson, Avery, Bladen, Caldwell, Caswell, Chatham, Chowan, Clay, Columbus, Currituck, Dare, Duplin, Franklin, Graham, Harnett, Haywood, Hertford, Hoke, Hyde, Jackson, Madison, Mitchell, Montgomery, Moore, Orange, Pamlico, Pender, Person, Perquimans, Randolph, Swain, Tyrrell, Washington, Warren, Yancey.

An additional follow-up for corrective work was done in dental dispensaries by a corps of seven field dentists working in sixty-nine counties. These dentists, equipped with portable outfits, visited 1,297 schools, examined 69,174 children, and gave dental treatment to 62,604. The counties in which this work was done were: Alamance, Alexander, Alleghany, Ashe, Bertie, Brunswick, Burke, Cabarrus, Caswell, Catawba, Chatham, Cherokee, Chowan, Cleveland, Columbus, Craven, Cumberland, Davidson, Davie, Duplin, Durham, Forsyth, Franklin, Gaston, Gates, Graham, Greene, Guilford, Halifax, Harnett, Haywood, Henderson, Hertford, Hoke, Hyde, Iredell, Jackson, Jones, Lee, Lenoir, Lincoln, Macon, Madison, Martin, Mecklenburg, Mitchell, Moore, Nash, New Hanover, Onslow, Orange, Pamlico, Pasquotank, Perquimans, Person, Richmond, Rowan, Stanly, Surry, Swain, Tyrrell, Union, Vance, Wake, Watauga, Wilkes, Wilson, Yadkin, Yancey.

BUREAU OF HEALTH EDUCATION

The general educational work of the Board is headed up in this division with the editing of *The Health Bulletin* as the principal work.

The Health Bulletin has been issued monthly to a list of approximately 25,000, the mailing list being made up of those who have requested that it be sent to them regularly. Each issue contains thirty-two pages of material covering a rather wide variety of articles on health subjects.

In addition from time to time special pamphlets, placards and newspaper articles are prepared, and former special pamphlets revised. The distribution of special pieces of educational health literature during the biennium reached approximately 1,500,000.

A visual educational unit is maintained eight months each. A truck is equipped with a generating outfit, a portable motion picture projector, and about eighty reels of health subjects are available from which to make up programs. Exhibitions were given to audiences totaling 81,520 in twenty-eight counties as follows: Alleghany, Ashe, Bladen, Buncombe, Cabarrus, Carteret, Columbus, Davidson, Durham, Edgecombe, Granville, Halifax, Harnett, Nash, Pitt, Randolph, Richmond, Rowan, Rutherford, Sampson, Surry, Vance, Wake, Watauga, Wayne, Wilkes, Wilson, Transylvania.

LIFE EXTENSION UNIT

In January, 1929, with the financial assistance of the Rockefeller Foundation a new piece of work was organized as the Life Extension Unit with a medical director and a nurse assistant.

Primarily the object of this work is to promote periodic health examinations. During the six months covered by this report the work has consisted entirely of demonstration clinics conducted for the physicians in a number of counties for the purpose of emphasizing the technique of making physical examinations of the apparently well individual, and of educational addresses before civic clubs, women's clubs, parent-teacher associations and other organizations stressing the importance of having such examinations made at least annually.

THE BUREAU OF SANITARY ENGINEERING AND INSPECTION

Character of Work

The activities of this bureau embrace all of the non-medical activities of the State Board of Health. The community or area, usually the municipality instead of the individual is the object of attention.

Improvement in the sanitation conditions and surroundings for the prevention and reduction of the spread of disease, is the basis of the bureau activities. These measures involve practical sanitation measures, engineering, chemistry and biology, both from the standpoint of their practical application and scientific investigative activities essential to the execution of sound and safe policies consistent with wise public economy.

Prior to this biennium the work has been mainly educational in the promotion of community interest for essential sanitary improvements such as water supply, sewerage, and milk sanitation, and enforcement of State laws, such as the sanitary privy law and the statutes regulating the protection of water supply and the disposal of sewage. The very rapid municipal and industrial development of the State, however, has necessitated extensive scientific investigations highly specialized in the sanitary biology and chemistry of water purification, sewage treatment and stream pollution.

The various functions of the bureau are administered through the following divisions manned by specially-trained personnel:

1. Sanitary Inspection.
2. Jail and Convict Camp Regulation.
3. Milk Sanitation.
4. Shellfish Sanitation.
5. School Water Supply and Sewage Disposal Engineering Service.
6. State Institution Engineering Service.
7. Water Supply.
8. Sewage Disposal.
9. Investigative Studies of Stream Pollution, and Sewage and Industrial Wastes Disposal.

SANITARY INSPECTION DIVISION

Objective

1. The prevention of disease caused by insanitary disposal of excreta.
2. Improved sanitary management of hotels and cafes.
3. Improved sanitary management of State institutions.
4. Improved sanitation in other matters affecting the public health.

Methods

1. Rigid enforcement of the State Sanitary Privy law with respect to the sanitary construction and maintenance of privies in accordance with the regulations adopted by the State Board of Health under the provision of this act. This is done through a force of sanitary inspectors consisting of nine inspectors and two supervisors. Each supervisor does hotel and cafe inspections and handles special investigations and complaints in the section of the State assigned as his territory. One supervisor does jail and convict camp regulation, executing the duties of both the State Board of Health and the Welfare Department. Less than half of his time is devoted to sanitary inspection activities for the State Board of Health. The in-

spectors distribute sanitation literature, inspect privies, cite defects of privy construction and maintenance, advise and show property owners and tenants with regard to sanitary construction and maintenance of privies, issue notices for compliance with the law, and when unable to secure compliance with reasonable effort after the expiration of notice issued they prosecute the violator in the magistrate's court. They secure the adoption of local ordinances requiring connection to the public sewerage system where available and assist in the enforcement of these ordinances. They stimulate the installation of public water supply and sewerage systems and concessions in the enforcement of the privy law are allowed towns undertaking these sanitary improvements.

2. Hotels and cafes are inspected and rated and the provisions of the hotel and cafe law are rigidly enforced. In extreme cases of violation the violators are given the privilege of closing up temporarily for improvement, closing up permanently, or submitting to prosecution for violation of the law.

3. The State institutions are inspected and reports with recommendations are submitted to the boards of directors.

4. Many miscellaneous matters of sanitation in which the public health is to some extent involved require attention. These inspections are usually made in connection with and for the assistance of local officials. They include such problems as swimming pools, markets, slaughter pens, drainage, and the common nuisance complaints with regard to which local officials request advice and information.

Results

The period of this biennium has been consumed in both sanitary privy construction and maintenance supervision activities. Experience in maintenance supervision has forcibly demonstrated the wisdom of the Board's policy of adherence to a definite plan of essential items in privy construction. In addition to securing more effective sanitation, and facilitating the maintenance problem the property owners are better satisfied and highly pleased that it is not necessary to continually call on them for repairs. The detailed activities of this division are enumerated as follows:

Total number privies inspected	80,517
Total number privies approved	73,963
Total number sewer connections made	6,442
Total number septic tanks constructed	854
Total number privies condemned (sewer area)	2,073
New privies built	1,770
Prosecutions, privy law, including sewer connections	672
Hotels and cafes inspected	529
Hotels and cafes rated	415
Prosecutions, hotel and cafe law	39
Investigations of special complaints	27
Total number State institution inspections	62

JAIL AND CONVICT CAMP INSPECTION

Objective

1. The enforcement of the statutes pertaining to the sanitary protection and hygienic care of prisoners.
2. Assisting the Welfare Department in connection with the welfare of prisoners.

Methods

This is a unit conducted in coöperation with the Welfare Department. The chief sanitary inspector with the coöperation of the sanitary inspection force enforces the statutes and State Board of Health regulations pertaining to the sanitary and hygienic care of prisoners.

Practical and economic ways and means for providing the protection provided for in the statutes have been developed. The work is conducted first, on a basis of coöperation with the local responsible officials, rendering service wherever possible in helping them work out necessary improvements, and second, on an enforcement basis where the spirit of coöperation is lacking on the part of the local officials.

Results Obtained

TABLE I

COUNTY JAIL IMPROVEMENTS:

No. new county jails constructed	24
No. new county jails under construction	3
No. county jail annexes constructed	6
No. county jails improved and repaired	26
No. county jails "disapproved"	5
No. county jails inadequate and use discontinued	3
No. county jail plans approved for future construction	2
No. county jails inspected and reinspected	100

CITY JAIL IMPROVEMENTS:

No. new city and town jails constructed	10
No. town jails improved and repaired	12
No. city and town jails inspected and reinspected	36

TABLE II

CONVICT PRISON CAMP IMPROVEMENTS:

No. new prison camps constructed	18
No. prison annexes constructed for camps	8
No. prison camps improved and repaired	36
No. prison camps inspected and reinspected	74
No. counties maintaining convict prison camps	43
No. counties abolished convict prison camps	6
No. new prison camps under construction	1

PRISONERS' HEALTH: The sanitary and hygienic conditions affecting the health of prisoners have been examined with care. More favorable location and better natural drained sites have been selected for the prisons and convict prison camps with a minimum exposure to nuisances, mosquito breeding places, fly breeding places and depressions.

The water supplies of the prisons have been inspected and samples collected from them for the State Laboratory of Hygiene to make analysis of their safety for drinking purposes. Five of them have been condemned for insanitary conditions and heavy pollution of the water.

The air space and ventilation for jails, prisons, solitary confinement cells, and prison cages have been checked up on and improvements made where required.

Bathing facilities with hot and cold water shower bath arrangements have been installed in a large majority of the prison camps and jails. Sewerage systems have been installed for the prisons wherever running water is available. Heating and lighting systems found inadequate have been corrected. The methods for handling and disposing of garbage and

rubbish have been improved. Prisoners with infectious and venereal diseases are required to be isolated from other prisoners. The prison officials, county health officers, and physicians have observed this requirement with a fair degree of satisfactory result. Only two prison camps have experienced an outbreak of contagious diseases within the past three years. These were very mild and no deaths resulted.

The average prison population of the State is approximately 3,500 each month. This includes all the counties, cities, towns, and State prison systems.

MILK SANITATION DIVISION

Objective

1. More widespread sanitary regulation of milk supplies by local health agencies.
2. Development of uniform standards of milk sanitation which will promote its production and consumption through increased public confidence in its safety.
3. Effective public health protection through the efficient sanitation of municipal milk supplies.

Methods

1. A standard form of milk sanitation ordinance has been prepared, embodying the best practice in the regulation of milk supplies. This ordinance is furnished to local officials desiring such information. In addition, local officials are assisted in making preliminary surveys, organizing the work of enforcing the ordinance, establishing the necessary laboratory control, advising dairymen and pasteurization plant operators with regard to the most practicable and economical methods of complying with the ordinance and in such other ways as will be of assistance in establishing more widespread and more efficient municipal regulation of local milk supplies.

2. The same service offered to municipalities for the establishment of new milk control units, as outlined above, is offered to existing units who desire to harmonize their milk sanitation requirements with the standard. All cities are advised to adopt the standard form of milk regulation in the interest of establishing uniform standards of milk sanitation that will be comparable on the same basis for all municipalities. This is done to establish a universal or standard unit of measure as a basis to enable the evaluation of the protection afforded by milk sanitation. Thus more uniformly effective results may be attained, and the public confidence increased in the safety afforded by municipal regulation of the milk supply.

Moreover, in cities having the same standards a temporary shortage in the milk supply of one can be made up from a surplus in another without nullifying the milk sanitation regulations, since these are the same in both places.

3. The services of the division are available to any city upon request to assist and cooperate with them in the administration of any milk control ordinance under which they may be operating, to the end that public health protection through the sanitation of the milk supply may be extended.

Results Obtained

In 1924 there were 61 cities in the State having populations of 2,500 and over, which were regarded as of practicable size to support and efficiently carry out a milk sanitation program. For further convenience these 61 cities were divided into three population groups as follows: Group A, those cities with 5,000 and over; Group B, those cities with from 3,000 to 5,000; and Group C, those cities with from 2,500 to 3,000. The percentage of the total population of the 61 cities embraced by each group was as follows:

	<i>Group</i> <i>A</i>	<i>Group</i> <i>B</i>	<i>Group</i> <i>C</i>
1924	83	11	6
1928	84	10	6

In order to serve the greatest population in the shortest possible time attention was concentrated on the cities comprising Group A. Furthermore, the cities of this size would be better able to assume the expense entailed than the smaller ones. The following table (page 64) shows the growth of population in the three groups from 1924 to 1928, and the populations served by milk ordinances. The same facts are graphically presented in the shaded circles of Figure 1 (page 65), the area of each circle being proportional to the population it represents.

MILK ORDINANCE STATUS OF SIXTY-ONE CITIES
2,500 Population and Over
LOCAL MILK ORDINANCES IN EFFECT

1924

CITY POPULATION GROUPS:	GROUP A 5,000 and Over		GROUP B 3,000 to 5,000		GROUP C 2,500 to 3,000		TOTAL All Over 2,500					
	No. of Cities	Population	% of Total	No. of Cities	Pop.	% of Total	No. of Cities	Population	% of Total			
Milk Ordinance in Effect	20	405,745	83.1	1	4,771	7.4	0	21	410,516	69.8		
No milk Ordinance	10	82,240	16.9	16	59,457	92.6	14	35,586	100.0	40	177,283	30.2
TOTAL	30	487,985	100.0	17	64,228	100.0	14	35,586	100.0	61	587,799	100.0

STANDARD MILK ORDINANCES AND OTHER LOCAL MILK ORDINANCES

1926

Standard Milk Ordinance in Effect.....	23*	373,831	72.8	6	25,103	37.5	2	2,585	7.0	31	401,519	65.0
Other Local Milk Ordinances.....	4	119,033	23.2	0			0			4	119,033	19.3
Total, All Milk Ordinances.....	27*	492,864	96.0	6	25,103	37.5	2	2,585	7.0	35	520,552	84.3
No Milk Ordinance.....	3	20,642	4.0	11	41,951	62.5	12	34,277	93.0	26	96,870	15.7
TOTAL	30*	513,506	100.0	17	67,054	100.0	14	36,862	100.0	61	617,422	100.0

1928

Standard Milk Ordinance in Effect.....	26*	490,823	79.7	8	34,447	46.5	3	12,880	30.4	37	538,150	73.5
Other Local Milk Ordinances.....	4	125,146	20.3	0			0			4	125,146	17.1
Total, All Milk Ordinances.....	30*	615,969	100.0	8	34,447	46.5	3	12,880	30.4	41	663,296	90.6
No Milk Ordinances.....	0			10	39,683	53.5	10	29,508	69.6	20	69,191	9.4
TOTAL	30*	615,969	100.0	18	74,130	100.0	13	42,388	100.0	61	732,487	100.0

*Includes 8 small cities administered by two units. Actual number of cities 6 more than this number.

STANDARD MILK ORDINANCE ADOPTIONS AND OTHER MILK ORDINANCES IN EFFECT IN SIXTY-ONE CITIES OF 2,500 POPULATION AND OVER

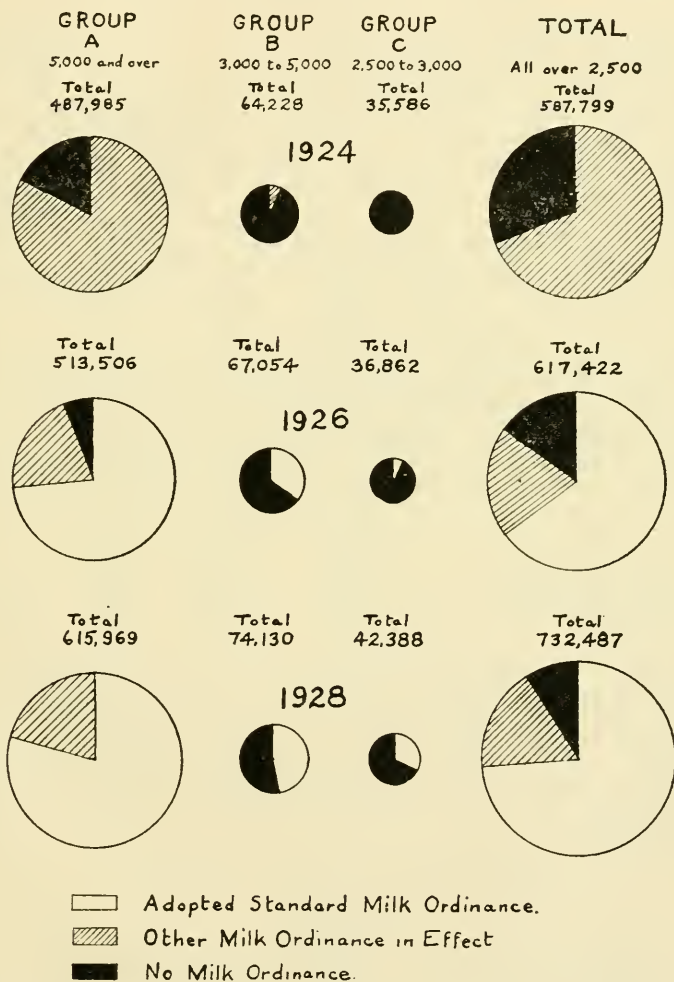


Fig. 1

Note that the entire population of Group A is now served by a milk ordinance of some kind, and that the adoption of milk sanitation measures by the smaller municipalities is rapidly increasing.

Not shown in either table or figure are three additional milk control units, each with a population of less than 2,500. These units are Elkin, Whiteville, and Forsyth county unit. The latter embraces three towns, Kernersville, Rural Hall and Walkertown, all administered by the one central organization. The additional population benefited is about 5,592. This increases the totals as follows:

	No.	Population
Standard Milk Ordinance Units	40*	543,742
Other Local Milk Ordinances	4	125,146
Total served by Milk Ordinances	44*	668,888

As in 1926, an associate milk specialist of the United States Public Health Service coöperated with the division during the summer of 1928 in rating all the municipal milk supplies operating under the Standard Milk Ordinance. Of the 26 cities rated in 1926, the average rating for raw milk was 78; for the same cities in 1928 the average rating was 80. Seven cities with pasteurization facilities in 1926 averaged 62 for the Raw Milk delivered to plants; in 1928 this was 77. Their pasteurization plant and process ratings averaged 58 in 1926; in 1928 this was 56. The lack of improvement in the pasteurization plant and process ratings is due to the adoption of higher standards by the United States Public Health Service for pasteurizing equipment, which the plants had not had the opportunity to meet before the survey was made, and it does not indicate any marked change for the worse in the quality of pasteurized milk.

The daily consumption of milk in 27 Standard Ordinance cities has increased, both raw and pasteurized, as shown in the following table:

	1926 Gallons Per Day	1928 Gallons Per Day	Increase Over 1928 Gallons Per Day	%
Retail Raw Milk	14,648	17,514	2,866	16.3
Pasteurized Milk	5,050	6,983	1,933	38.3
Total	19,698	24,497	4,799	24.4

Expressing the consumption in terms of "pints per capita per day" we find to be misleading when computed for individual cities, especially in the cases of resorts and college cities. Here the population figures will be invariably too small, while the quantity of milk sold will be consumed by permanent residents and transients alike. For the entire 27 cities, however, the consumption in pints per capita per day was .38 pint in 1926 and .41 pint in 1928.

SHELLFISH SANITATION DIVISION

Objective

1. The sanitary protection of shellfish growing areas and the enforcement of standard regulations of shellfish handling to

(a) Prevent the spread of disease from the consumption of shellfish grown in polluted water, or from shellfish bearing the germs of contagious disease due to insanitary methods of handling, and,

*Includes 8 small cities administered by two units. Actual number of cities 6 more than this number.

(b) Aid in stabilizing the North Carolina shellfish industry by establishing the public confidence in the safety of this important food product.

Methods

The Fisheries Commission boat *Pamlico* which was refitted with a laboratory and equipment, has been replaced by a shore laboratory at Morehead City sufficient to make routine bacteriological tests of water in shellfish-growing areas, and bacteriological examination of the shellfish from the beds, and as handled in preparation for market.

The work is conducted by a sanitary biologist detailed by the State Board of Health.

A system of certificates issued for any growing area conforming to the sanitary requirements as determined by sanitary survey and laboratory examinations is used.

Special certificates are also issued to all shucking house operators whose equipment and methods are found by inspection and test to conform to the regulations.

Since the Fisheries Commission offices are most convenient as the headquarters for this activity, these joint Fisheries Commission and State Board of Health certificates are issued from that office.

Results

1. Complete sanitary surveys of the shellfish-growing areas have been continued. In connection with these surveys bacteriological examination of the water at numerous points over the areas have been made. As a further check large numbers of bacteriological examinations of shellfish taken directly from the waters are made.

These surveys disclose the fact that with the exception of portions of Wrightsville Sound and portions of Morehead and Beaufort harbors the waters of the entire growing areas are in excellent sanitary condition. Restrictions have been imposed and are enforced prohibiting the taking of shellfish, from the above cited exceptional areas, for use as food products.

2. By frequent inspection and education work, the shucking houses have been made to conform to the sanitary regulations adopted by the State Board of Health and Fisheries Commission and approved by the U. S. Public Health Service. This service has interested shellfish handlers in improved shucking house arrangements, resulting in new shucking houses and other improved handling facilities.

3. The execution of these regulations and control measures has protected and established the safety of shellfish from North Carolina waters.

Regulations suitable for adoption by municipalities, controlling handling of shellfish in local markets, have been prepared and have been adopted by three cities. This is expected to have a strong influence in further guaranteeing the safety of shellfish to North Carolina consumers, and further establishing the public confidence in this food product.

4. Definitely establishing the safety of the North Carolina shellfish products has reestablished public confidence in the safety of this product of one of the State's most important industries, and has provided a definite clearance for these products in the markets. Without these control measures and the system of sanitary certificates issued to shippers there would be no market for the North Carolina shellfish products. These

measures have saved the shellfish industry in North Carolina and placed it on a much more stable basis than existed prior to the typhoid scare and consequent demoralization of the shellfish market in 1924. (Also see Fisheries Commission report, particularly with regard to the economic significance of shellfish control measures.)

SCHOOL WATER SUPPLY AND SEWAGE DISPOSAL ENGINEERING SERVICE DIVISION

Objective

1. Improved school sanitation through promotion of adequate water supply, sewerage system and sewage treatment facilities.
2. The installation of properly designed and constructed sewage disposal facilities to prevent wasting the public money in unsuitable and inefficient installations.
3. Promotion of correct maintenance attention.

Methods

This work is carried on under the direct supervision of an engineer assigned to this work who is also given the assistance of the sanitary inspection division to carry out such preliminary investigations and subsequent inspection of the work as proves necessary. This preliminary investigation of each specific school problem consists of determining the type of water supply or sewerage systems and sewage treatment plants most suitable for the local conditions. Plans of installation to fit each specific problem are then furnished to the county superintendent or school authorities. Assistance to the school authorities or architect in letting the contract is furnished if requested. During the course of construction after the contract letting an inspection is given to each job as often as may be necessary. After the completion of the work a final inspection of the work is performed and an official approval of the actual installation is furnished. Assistance of any character is furnished at any time that may be constructive in promoting sanitary school conditions and economical installation of adequate and permanent school sanitary facilities. This same assistance is given to all school officials, engineers, architects, contractors or any others who may be interested in work of this nature.

Attention is also given to the maintenance of those facilities already installed. Inspections are made to determine the condition of the systems and suggestions furnished to maintain the plants in correct functioning order.

In case of any specific problem that arises in connection with these facilities the division always stands ready to lend assistance in working out the problem to a satisfactory degree.

Results

The two most outstanding benefits of the efforts of this division are:

First: The improvement in sanitary conditions of schools in almost every county in the State through the elimination of insanitary and unsatisfactory sewage treatment plants and the improvement of sanitary surroundings of water supplies.

Second: The prevention of the installation of inadequate and insanitary facilities at new schools. This second feature is of importance not only

from the sanitary standpoint but also from the standpoint of economy. These proposed inadequate installations would have to be abandoned and replaced in a short time by installations of proper design and construction, thereby increasing the total cost by the amount of the original construction. This additional cost has been eliminated by intercepting those inadequate and substituting an approved design.

An idea of the magnitude of this work in diversity of design, scope of territory, total cost of construction and savings thereby effected can readily be obtained from the following tabulation:

No. counties covered by personal contact	95
No. counties in which coöperation from county officials was secured	90
No. water supplies inspected	300
No. sand filter installations	85
No. underground drainage installations	170
No. tank treatments alone	45
Total No. of installations	300
Total cost of work supervised	\$600,000
Value of engineering services performed thereon	48,000
Savings effected for counties by elimination of proposed inadequate plants	150,000
Gross savings	\$198,000
Departmental cost of service	3,458
Net savings to 90 counties	\$194,542

STATE INSTITUTION WATER SUPPLY AND SEWAGE DISPOSAL ENGINEERING SERVICE DIVISION

Objective

1. Fullest possible utilization of the Bureau of Engineering personnel and facilities to the service of the State in handling the engineering problems of the State's institutions.

Methods

Such time of one engineer as needed is allotted to studying the specific water supply and sewerage problems of State institutions and where necessary to design, preparation of cost estimates and supervision of construction of new works or the improvement of existing works.

Proper maintenance of plants is promoted by intermittent inspection of these utilities at each institution with suitable advice and recommendations to the institution superintendents.

Results

First: Improvement in sanitary conditions has resulted in practically every State institution having privately owned water supply or sewage treatment plants.

Second: Improved operation of these plants has been obtained. In some cases this improved operation has been sufficient to eliminate the necessity of a new installation which otherwise would have been necessary to offset the poor operation provided.

Third: Saving to the State through elimination of necessarily high engineering fees for these small jobs, strict supervision of competent or unscrupulous contractors in those cases where engineering services would

not have been obtained, and consideration to future expansion of the institution as well as present needs. In a number of cases this last service has resulted in a considerable saving by preventing the installation of proposed inadequate plants, which would have had to be abandoned in a short time.

The total amount of work supervised over the past two years and the saving effected thereby is shown by the following tabulation:

No. institutional water supplies inspected.....	31
No. institutional sewerage systems inspected.....	31
Total cost of work supervised.....	\$65,700

Saving Effected

Correction of engineers' design to one of less expensive design.....	\$12,000
Curtailing incompetent activities of a contractor.....	2,000
Elimination of contractors' profit by using institutional labor.....	400
Engineering fees	5,600
Gross savings	\$20,000
Departmental cost of supervision.....	1,080
Net savings to State	\$18,920

PUBLIC WATER SUPPLY DIVISION

Objective

1. More extensive public water supply service for the municipalities and other congested population groups in the State such as mill villages.
2. The most effective possible public health protection in the design, construction and maintenance of public water supply systems.

Methods

1. Unceasing public education through all divisions of the bureau activities but mainly through the sanitary inspectors.
2. Careful review in the approval of all plans.
3. Constant supervision and training of local personnel.

Results

1. State Board of Health supervision continues to be an aid in safeguarding small towns against incompetent engineering service. This supervision has been particularly valuable to small towns who usually employ engineering service for the first time on the "bargain counter" plan.

2. All of the projects have been designed and built in accordance with the best recognized principles of modern water supply and filter plant practice. Our North Carolina engineers again get credit for handling all the larger projects and a majority of the smaller ones.

3. No requirements have been made of municipalities in excess of those essential to adequate water supply and protection. By so doing the State Board of Health has helped to reduce the expenditures of the municipalities for water supply utilities to a minimum consistent with safety.

4. Technically trained men have been secured to operate municipal filter plants. Whenever a municipality employs a plant operator, enough time is spent with this operator to thoroughly train him in practical filter plant operation and laboratory control of filtration. Much time has been spent

on the further training of plant operators already employed and the work of all plant operators is frequently checked by field inspections.

5. Forty plants, serving a population of 521,342 or 77% of the population served by filtered water supply are operated by trained men. These men with their technical knowledge and guided by their daily chemical and bacteriological tests, are able to secure the full effectiveness in purification for which the plants are designed.

6. One hundred and ninety-nine water supplies which supply mills and mill villages, having a population of 83,336, have been inspected and listed. Most of these supplies will require more frequent inspections than the municipal supplies in order to properly safeguard the health of the people served by them.

All institutional water supplies have received special attention regarding their safety, operation and maintenance.

TABLE I

ALL PUBLIC WATER SUPPLIES:	7-1-26	7-1-28	Gain
Water supplies under supervision	180	190	10
Population thus served	768,857	870,141	101,284
Total population of the State served	27.92%	30.05%	
Total population of incorporated towns served	90.22%	98%	
Capital invested	\$37,000,000	\$41,000,000	\$4,000,000
Annual cost of operation	3,750,000	4,800,000	1,050,000
Projects completed or under construction			55
Population thus served			169,598
MILL SUPPLIES:			
Water supplies under supervision	53	199	146
Population thus served	45,334	83,336	38,002
Total population of the State served	1.65%	3.03%	
Number filter plants		4	
Number well supplies		193	
Number surface supplies		2	
STATE INSTITUTIONS:			
Water supplies under supervision		31	
Population thus served		20,377	
Number using city supply		14	
Number using well supply		9	
Number using surface supply		2	
Number using filtered surface supply		5*	
FILTER PLANTS:			
Number plants under supervision	73	83†	10
Population thus served	573,442	677,497	104,055
Plants under trained operators and laboratory control	38	40	2
Population thus served	501,653	521,342	19,689
Filter plants improved			9
New filter plants			10
Population thus served			133,734
Sterilization equipment provided	73	83	10
UNFILTERED SURFACE SUPPLIES:			
Number supplies under supervision	27	25	
Population served	66,916	67,827	913
Number complied sterilization regulations	25	24	
Population served	65,388	66,219	831
GROUND WATER SUPPLIES:			
Number supplies under supervision	138	296	158
Population served	177,642	227,010	49,368
Total number water supplies under supervision	238	420	182
Total population served	818,000	973,854	155,854

*One filter plant supplies two institutions and one plant supplies two towns.

†One of these plants supplies three towns and eight plants supply two towns each.

SEWAGE DISPOSAL DIVISION

Objective

1. Promotion of community sewerage systems for the more effective sanitary disposal of sewage.
2. The enforcement of the statutes to afford adequate protection of public water supplies against pollution, and the sanitary protection of streams essential to the other lawful uses of waterways.
3. The prevention of wasteful expenditure for systems of treatment unsuitable for attaining objective (2) or in excess of such essential requirements.
4. Coöperative supervision of the operation of sewage treatment plants to secure their most efficient and most economical operation.
5. The guidance of municipalities and others responsible for the installation of sewage treatment works, in the adoption of the most suitable and most economical systems.

Methods

1. The promotion of more extensive sewerage, like the promotion of more widespread water supply, is done principally through the sanitary inspection division.
2. The sewerage laws enforcement is effected through the official approval of plans, and the rigid vigilance of all divisions of the bureau.
3. Through stream pollution studies, and the study of efficiency existing works, the measure of pollution removal necessary to be accomplished and the proper efficiency of respective types and degrees of treatment are compared and the essential degree of treatment, and no more than the essential is required.
4. In sewage treatment, proper scientifically controlled operation is essential economy as well as to securing the degree of efficiency for which plants are designed. Close supervision and training of local operators by expert operation personnel is therefore both an obligation and constitutes an invaluable service to municipalities.
5. Ability to guide municipalities in the selection of types of treatment, and to properly advise their designing engineers, is largely dependent upon the information gained in the study, supervision and observation of plants in service.

While the bureau, and in this division, has to function as a law enforcement agency, the element of service is held paramount. The bureau would be as much remiss in requiring through inadequate knowledge of the problem, or allowing without protest, greater expenditure for sewage treatment than the conditions warrant, as it would be for failing to protect the public interest in enforcing adequate sewage treatment protection.

Results

Sewage treatment in North Carolina, due to the early laws requiring protection of water supply streams has become a "habit" but all too often with no definite aim other than compliance with the letter of the statute. There are today more treatment plants in the State than necessary, but for less benefit of treatment than conditions require.

With the exception of recent plants most of the present treatment plants are of little value in accomplishment.

The plants have been surveyed and classified as to importance of the pollution problem, the extent and character of plant, and possibility of improvement.

Upon the more pressing conditions official reports with recommendations have been submitted to the local officials. Careful analytical studies have been made of sewage plants.

The present status of the extent of sewage treatment is set forth in the following table:

	No.	Pop. Served	% Total State Pop. Served
Towns with sewer systems	176	844,700	29%
Towns with disposal plants	72	635,000	21.8%
Towns with no disposal plants	92	209,700	7.2%
Towns with part of sewage treated and part untreated	12		
Total plans submitted this biennium	64	212,864	7.32%
Total plans approved this biennium	48	202,878	6.98%
Plans submitted for sewer systems	24	27,691	
Plans approved for sewer systems	15	19,491	
Plans submitted for disposal plants	31	161,773	
Plans approved for disposal plants	26	159,966	
Plans submitted for sewer systems and disposal plants	7	6,703	
Plans approved for sewer systems and disposal plants	5	5,315	
Plans submitted for improvements to disposal plants	2	21,247	
Plans approved for improvements to disposal plants	2	21,247	

SEWAGE, INDUSTRIAL WASTES AND STREAM POLLUTION INVESTIGATIONS DIVISIONS

Objective

- Such studies of sewage treatment, as to determine
 - The functioning efficiency of existing treatment works.
 - Factors that would improve efficiency.
 - The most suitable treatment works for given conditions.
 - The most economical solution of given sewage problems.
- Such studies of industrial wastes as will determine
 - The character and extent of wastes from different industrial processes.
 - The effects that these wastes have in connection with the usual processes of sewage treatment, when combined with sanitary sewage.
 - How to dispose of industrial wastes in a manner to protect the interests of all the uses of the streams into which they are discharged, and to accomplish this result with the greatest possible economy.
- Such studies of the streams of the State, particularly those into which large quantities of sewage and industrial wastes are discharged as to determine
 - The safe capacity of the streams for assimilation and destruction by natural processes of sewage and other waste materials.

By means of the foregoing it is hoped to establish safe public control policies in these matters, sufficiently based upon the facts of scientific information obtained as to most equitably administer the statutes with respect to the sanitary uses of streams both as a source of water supply and as natural and essential channels for the disposal of sewage and all waste materials.

With such information in hand the objective is to so establish the requirements of each case as to fully conserve the interests of the public in

public water supply protection, the conservation of fish life and other public interests in the sanitary conditions of streams, and at the same time avoid unfair and unnecessary burden upon municipalities and industries discharging sewage and other wastes into streams, in the cost of unsuitable or excessive treatment measures.

It is hoped also that with actual data available, civil suits against cities and industries for alleged damages from the pollution of streams and for nuisance conditions, may be settled on a basis of sound scientific facts and with minimum of prejudice.

Methods

1. A survey is first made of the drainage basin area above the point or points on the stream where specific analytical studies are to be made.

This survey includes the location of points of sewage and waste discharge with information relative to the amount and general character of polluting material.

These surveys are followed by analytical studies with field laboratory equipment and determinations made at the same time on samples sent to the bureau sewage and waste laboratory at Raleigh.

Wherever possible these studies are carried on coöperatively with the cities or industries having responsibility for the correction of conditions under investigation.

In order to more efficiently serve the State in all of its problems concerned in any way with the pollution of streams, a coöperative working plan has been developed with the Conservation Commission, which department has statutory control of the protection of fish life.

While the State Board of Health is the agency most concerned with the sanitary protection of streams, and likewise the agency equipped by personnel contact and major interest to conduct sanitary investigations, the Conservation Commission on the other hand is more concerned with the hydraulic properties and are actively engaged in such studies. Therefore, to avoid loss of efficiency through duplication of effort there has been formed the "Stream Sanitation and Conservation Committee" composed of the executive officers and chief engineers of the two departments. Through this committee the Conservation Commission makes stream flow measurements and collects any other hydraulic data incident to stream pollution investigations for any purpose, also through this committee the Bureau of Engineering makes the sanitary studies looking to the solution of stream pollution problems, regardless of which department has the main immediate interest in the results.

To be fully consistent in each department confining itself to the character of work for which it is best adapted, this bureau has taken over the duty of making mineral analysis of waters for the Conservation Commission.

Industries having unsolved waste disposal problems have been approached with the offer of coöperative study of their waste disposal problems.

Results

The development of this division has been in progress during the biennium.

Coöperatively with the Conservation Commission:

A study of pulp and paper mill wastes and their effect on the Roanoke river was made at Roanoke Rapids. Both water supply protection and the preservation of commercial fishing were involved.

A study of tannery wastes pollution of Scotts creek at Sylva has been made, mainly in connection with the interests of the Conservation Commission.

An intensive study of the Haw river basin and the sewage and industrial wastes of Greensboro and the industries of the vicinity is now in progress.

A formal agreement has been executed between the paper mills and the two State departments. Under this agreement, the industries undertake coöperatively with the State agencies, the study of waste problems with a view to determining practical methods of disposal which they agree to put into effect when developed.

The Textile Manufacturers Association have appointed a committee of three to work out, with the State agencies, a practical plan of coöperative study and solution of textile wastes problems.

In the meantime engineers of the bureau have made the preliminary surveys of the river basins in the Piedmont and western sections of the State, and the hosiery mill wastes research and experimental treatment conducted by the Sanitary Engineering department of the University in coöperation with the city of Durham, have been carried forward, and an early report is expected.

MEETINGS OF THE BOARD

(Including Meetings of the Executive Committee)

EXECUTIVE COMMITTEE MEETING

RALEIGH, N. C., AUGUST 27, 1926.

Upon call of the President of the Board, the Executive Committee met in the office of the secretary Friday, August 27, at 9:30 A.M., with Dr. J. Howell Way, president, and Dr. W. S. Rankin present. Upon invitation, members of the executive staff sat with the Committee.

The budget for the biennium 1927-29 was considered in detail and approved as follows: 1927-28 Administration, \$72,442; Laboratory of Hygiene, \$75,000; Engineering and Inspection, \$84,230; Vital Statistics, \$30,615; County Health Work, \$180,800; Maternity and Infancy, \$22,259.66; Health Education, \$12,150. Total, \$477,496.66.

Upon motion, it was resolved that the salary of the Secretary be made \$7,500 annually, and that he be allowed an assistant, whose title shall be "Assistant to the Secretary," at a salary of \$3,600.

In conformity with the expressed wishes of the Budget Bureau, the allocation from the public printing fund of the State for necessary printing for the Board was written into the Board's budget in the sum of \$25,000 annually.

Upon motion, it was resolved that certain phases of the Board's work heretofore carried on as entities by special bureaus be consolidated into the Bureau of County Health Work, to be administered by district deputy State health officers, with the State divided into four districts with an administrative director for each. The work as consolidated consists of the field work heretofore administered by the Bureau of Epidemiology, County Health Work, Maternity and Infancy and Medical Inspection of Schools. In reaching the decision to make this change in administration, the Committee was convinced that such a plan would (1) eliminate considerable travel expense and save loss of time for the field representatives; (2) by localizing the administration the district director would be enabled to become more thoroughly familiar with public health conditions, and by more extended personal contact be the better able to function; (3) responsibility for the general program of the Board in each district would be definitely fixed upon the district director; and (4) the State Health Officer would be in position to deal with his staff upon a basis of comparative statistics.

Upon motion, it was resolved that the President of the Board be authorized to ask the International Health Board to continue its financial assistance upon the basis of the following budgets, the Executive Committee expressing its conviction that it will be of great assistance to the Board if these appropriations are continued at this time, and that any cut in the appropriation might be misunderstood. It was further resolved that the International Health Board be requested to continue the assignment of Dr. H. A. Taylor to duty with this Board for the year 1927 in order that he may continue supervision of certain malaria control demonstrations now in process, and particularly an investigation into the probable effects of impounding water upon the incidence of malaria in contiguous territory, such an investigation now being under way in connection with certain im-

poundings affecting the counties of Rowan, Davidson, Stanly and Rutherford.

Upon motion, the President of the Board was authorized to offer to Dr. G. M. Cooper the position of Director of the Bureau of Health Education or District Deputy State Health Officer, with the recommendation to the Salary and Wage Commission that his salary be made at \$4,800. It was emphasized that the Committee wished Dr. Cooper to have first choice of the five available positions, the decision being left entirely to him.

Upon motion the Committee adjourned.

J. HOWELL WAY,
President.

BOARD MEETING

RALEIGH, DECEMBER 16, 1926.

The Board met at ten o'clock with President Way presiding and the following members present: Thompson, Rankin, Anderson, Crowell, Wright, Stanton, Tucker and Stowe.

Minutes of called meeting held June 15 were read and approved.

Dr. R. E. Broadway, health officer of Brunswick County, presented details of plan for tonsil-adenoid clinics in Brunswick County to be held by local physicians. He told of unpleasant experiences with representatives of the Board sent to his county and requested in lieu of services for medical inspection of schools, the maternity and infancy program, dental clinics, tonsil and adenoid clinics and visual education that equivalent financial aid be given direct to the county for expenditure under direction of the local health department. The request was referred to the Secretary and Dr. Wright with power for definite action.

Dr. Thompson was unanimously elected a member of the Executive Committee to succeed Dr. R. H. Lewis, deceased.

The Secretary reported attendance upon the meeting at Nashville, Tenn., of a sub-committee of the Committee on Municipal Health Department Practice of the American Public Health Association, engaged in formulating an appraisal form fitted to county health departments. When such appraisal form shall be completed the Board approved its application to a selected list of four or more counties for 1927, in the discretion of the Secretary.

Details of a proposed program of research in soil pollution were presented by the Secretary and he was directed to submit the program to the International Health Board with request for financial assistance in inaugurating and prosecuting such research study. On motion of Dr. Rankin the Board resolved: "In the event research work in soil pollution is undertaken, the field investigations incident to such study shall be carried on by the Bureau of Sanitary Engineering and Inspection, and all details of laboratory procedure incident thereto shall be approved by the Director of the State Laboratory of Hygiene, and monthly reports shall be made in duplicate and a copy submitted to the Director of the Laboratory."

Dr. Register, director Bureau of Vital Statistics, discussed the system of transcribing birth and death certificates for the U. S. Bureau of the Census, and requested either a return to the piece work basis formerly in vogue or increased personnel for this particular work. Upon motion of Dr. Rankin the Board ordered the matter referred to the Secretary with power to act.

Tentative draft of law with regard to treatment of school children having remediable defects was presented by the Secretary, and the advisability of offering same to the approaching General Assembly was discussed. Upon motion a committee consisting of the Secretary and Drs. Wright and Tucker was appointed to make amendments as might be deemed necessary, and offer this legislation for action by the General Assembly.

Suggestion as to change in official title of executive officer of the Board was discussed and it was the unanimous opinion of the Board the present title of "State Health Officer" should not be altered.

Upon motion of Dr. Thompson, seconded by Dr. Wright, the Board unanimously voted to request the General Assembly of 1927 to amend Section 7053, Consolidated Statutes, by striking out in said section the phrase "not to exceed \$5,000" and inserting in lieu thereof "not to exceed \$10,000."

President Way, on behalf of the Board, expressed the pleasure of the members in having present the new member, Dr. John B. Wright, long a leader in the profession of the State.

Upon motion the Board adjourned.

CHAS. O'H. LAUGHINGHOUSE,
Secretary.

EXECUTIVE COMMITTEE MEETING

RALEIGH, N. C., FEBRUARY 18, 1927.

The Executive Committee of the Board met in the office of the Secretary at ten o'clock A.M., Friday, February 18, 1927, with Dr. J. Howell Way and Dr. W. S. Rankin present.

A substitute bill amending the State Sanitary Privy law drafted by a sub-committee of the House Committee on Health, to be offered in lieu of H. B. 471 introduced by Mr. Poole of Hoke, was approved, the proposed bill being as follows:

"A BILL TO BE ENTITLED AN ACT TO AMEND CHAPTER 118, ARTICLE 8, SECTION 7130, CONSOLIDATED STATUTES, RELATING TO SANITARY PRIVIES.

"The General Assembly of North Carolina do enact:

"Section 1. Chapter 118, Article 8, Section 7130 is hereby amended by adding at the end thereof the following:

"'Provided, that plans and specifications for construction of privy buildings prescribed by the State Board of Health by authority of this article shall be construed as recommendatory, but not mandatory as to exact size, architecture and dimensions of same.'

"Sec. 2. This act shall be in force and effect from and after its ratification."

Acting in accordance with resolution adopted by the Board at its meeting on December 16, 1926, to the effect that the 1927 session of the General Assembly be requested to amend the law relative to the salary of the State Health Officer, the Executive Committee drafted the following bill for introduction in the General Assembly:

"A BILL ENTITLED 'AN ACT TO AMEND CONSOLIDATED STATUTES, CHAPTER 118, ARTICLE 1, SECTION 7053, RELATING TO STATE BOARD OF HEALTH, OFFICERS OF, SALARY OF SECRETARY, PAY OF MEMBERS.'

"The General Assembly of North Carolina do enact:

"Section 1. Amend Consolidated Statutes of North Carolina, Chapter 118, Article 1, Section 7053, in line thirteen (13) thereof by striking out the words 'not to exceed five thousand dollars.'

"Sec. 2. That this act shall be in effect from and after its ratification."

CHAS. O'H. LAUGHINGHOUSE,

Secretary.

BOARD MEETING

DURHAM, N. C.. APRIL 19, 1927.

The Board met in the Washington Duke Hotel at noon Tuesday, April 19, 1927, with President J. Howell Way presiding and the following members present: Doctors Thomas E. Anderson, Cyrus Thompson, E. J. Tucker, A. J. Crowell, D. A. Stanton, W. S. Rankin, John B. Wright and Mr. James P. Stowe.

The minutes of the meeting of the Board held in Raleigh on December 16, 1926, were read and approved.

Doctor Stanton placed in nomination for the office of Secretary of the Board, for a term of six years expiring April, 1933, the name of Doctor Charles O'H. Laughinghouse. The nomination was seconded by Doctor Thompson. Upon vote, Doctor Laughinghouse was unanimously elected.

Upon motion of Doctor Wright, seconded by Doctor Tucker, it was unanimously ordered that the salary of the Secretary and State Health Officer be fixed at \$8,000 per annum, said salary to be effective from and after March 7, 1927, in accordance with Chapter 143, Public Laws of North Carolina, Session of 1927, ratified March 7, the same being "An act to amend Chapter 118, Article 1, Section 7053, Volume 3, of the Consolidated Statutes relating to salary of the Secretary of State Board of Health and pay of members."

Upon motion of Doctor Crowell, seconded by Doctor Stanton, the Board ordered that malaria and bacillary dysentery be stricken from the list of reportable diseases in North Carolina.

Upon motion of Doctor Crowell, it was ordered that reallocation of budget in accordance with appropriation made by the 1927 General Assembly be referred to the Executive Committee.

Upon motion of Doctor Stanton, the matter of salary increase for bureau directors and the assistant to the secretary, was referred to the Executive Committee for action.

The Secretary called to the attention of the Board certain needed changes in rules and regulations with regard to public water supplies. Upon motion, it was ordered that the Secretary draft the desired amendments and report same to the Executive Committee for approval and reference to the next meeting of the Board.

The resignation of Doctor Rankin as a member of the Board was presented by Doctor Way and upon motion of Doctor Stanton, seconded by Doctor Crowell, was accepted effective at the close of the annual meeting of the Board.

"APRIL 7, 1927.

"Dr. J. Howell Way, President,
North Carolina State Board of Health,
Waynesville, N. C.

"My dear Dr. Way:

"I herewith tender my resignation as a member of the North Carolina State Board of Health and also as a member of the Executive Committee of the State Board of Health, and I request that my resignation be accepted and made effective at the first meeting of the Board following the receipt of this letter.

"The reason for this action is a pledge I gave in a conference held in the city of Raleigh, March 2, 1927. The conference had been called by Dr. John Q. Myers, President of the North Carolina State Medical Society, for the purpose of considering what action should be taken with reference to a bill introduced by Dr. Carl P. Parker, a member of the Lower House of the General Assembly from Northampton County, and which bill was endorsed and advocated by Dr. John B. Wright, Chairman of the Legislative Committee of the North Carolina State Medical Society.

"The purpose and effect of the bill was to (a) increase the membership of the North Carolina State Board of Health from nine to fourteen and (b) to give the Governor ten appointments and the State Medical Society four appointments instead of as under the present statutory provisions by which the Governor appoints five members and the State Medical Society elects four. This change in the manner of constituting the State Board of Health would have gone far in destroying the dual control of public health work by the State government and the Medical Society (a partnership which has resulted in the fifty years' life of the Board in an almost complete absence of political interference), and, in time, would have made the Board largely a creature of political interests.

"At the conference there were present the following: Dr. Carl P. Parker, Dr. John B. Wright, Dr. John Q. Myers, President of the North Carolina State Medical Society; Dr. F. M. Davis, Chairman of the Section on Preventive Medicine of the State Medical Society; Dr. John W. MacConnel, Secretary of the North Carolina State Board of Medical Examiners; Mr. James P. Stowe, a member of the North Carolina State Board of Health and a representative of the State Pharmaceutical Association; Dr. J. Howell Way, President of the North Carolina State Board of Health, and Drs. Cyrus Thompson, D. A. Stanton, A. J. Crowell and W. S. Rankin, members of the North Carolina State Board of Health.

"Of those present at the conference, Dr. Carl P. Parker, the author of the bill under consideration, and Dr. John B. Wright, Chairman of the Legislative Committee of the State Medical Society, favored the proposed legislation and the other members present opposed it. The ground taken by the proponents of the bill was that the present distribution of the membership of the Board did not afford that general representation of all sections of the State that was desirable, that at present three members of the Board were residents of the city of Charlotte, and that only one member of the Board resided east of the Seaboard Air Line Railroad. The opponents of the bill, on the other hand, called attention to the fact that the existing distribution of the Board members was a temporary condition, having resulted from the death of a member living in Raleigh and the election of an eastern member as Chief Executive Officer of the Board, necessitating his removal to Raleigh and the removal from Raleigh to Charlotte, for business reasons, of another member of the Board, all of which changes had occurred within the last fifteen months, prior to which time four of the nine members of the Board were from Raleigh and east of the Seaboard.

"Dr. Parker, the author of the bill, in his discussion of the reason for his course of action, evidenced such sincerity of purpose and indicated such a generous willingness to adjust the matter to the wishes of the majority of the conference, insofar as an adjustment might be brought about, that I, in order to show my sympathy and appreciation for his position and manly course of action, pledged myself to resign at the first meeting of the Board and to urge the election of an eastern man as my successor.

restoring a more even geographic distribution of the membership of the Board, giving Raleigh and the section east of Raleigh three members, and thereby removing, to a large extent, the only argument openly advanced for the bill. Dr. Parker, having as a result of the conference, appeared before the Committee on Public Health of the Senate and requested that his bill, which had previously passed the House, be reported unfavorably, there is no other course for me to follow than to offer my resignation and urge its acceptance with the election of an eastern man to fill the vacancy.

"In severing my connection with the Board of Health I desire to record my deep and lasting appreciation of the opportunity which I have had, through my connection with the Board, to serve my State, to thank the members of the Board collectively and individually, for the courteous and generous consideration which they have always accorded me, and for the delightful personal relations which my association with the Board has brought about and which my resignation will not, in the least, impair.

"Very respectfully yours,

"(Signed) W. S. RANKIN."

To succeed Doctor Rankin to fill in the unexpired term, ending April, 1929, Dr. L. E. McDaniel, Jackson, N. C., was placed in nomination by Doctor Stanton, seconded by Mr. Stowe. Upon vote, Doctor McDaniel was unanimously elected.

To fill the vacancy caused by the resignation of Doctor Rankin, Doctor Anderson was unanimously elected a member of the Executive Committee.

Doctor Tucker reported to the Board the action of the State Dental Society in appointing a committee to confer and act with the Secretary in arranging for a course in Oral Hygiene to be taught in the teacher training schools of the State. The committee appointed is as follows:

Dr. E. B. Howle, President, ex-officio chairman. First District, Dr. I. R. Self, Lincolnton; Second District, Dr. Finn Horton, Winston-Salem; Third District, Dr. E. J. Tucker, Roxboro; Fourth District, Dr. E. H. Broughton, Raleigh; Fifth District, Dr. J. N. Johnson, Goldsboro.

Upon motion at 12:30 the Board recessed pending the call of the President.

CHAS. O'H. LAUGHINGHOUSE,
Secretary.

BOARD MEETING

DURHAM, N. C., APRIL 20, 1927.

The Board was called to order at the Washington Duke Hotel at 11:30 P.M. from recess of Tuesday, April 19th, with President Way presiding and the following members present: Doctors Thomas E. Anderson, Cyrus Thompson, E. J. Tucker, A. J. Crowell, D. A. Stanton, W. S. Rankin, John B. Wright and Mr. James P. Stowe.

It was suggested by Doctor Tucker that Hon. A. T. Allen, Superintendent of Public Instruction, be requested, by the Secretary, to confer with the Oral Hygiene Committee of the State Dental Society with regard to having the course in Oral Hygiene introduced into the Teacher Training Schools of the State.

The Secretary called the attention of the Board to the invitation extended by the Health Committee of the League of Nations to Dr. C. A. Shore, Director of the Board's Laboratory of Hygiene, to attend the International Rabies Conference to be held during the current week in Paris at Pasteur's old home. The Secretary reported that he had approved

Dr. Shore's attending this conference and that he had done so after consultation with Governor McLean and that the latter had heartily approved such action and had been most complimentary with regard to Dr. Shore's service to the Board and the value of the Board's work to the State. The Board unanimously approved the action of the Executive Officer and adopted the following resolutions:

"Whereas, Dr. C. A. Shore has been in the employment of the State Board of Health as Director of the Laboratory of Hygiene since April 1, 1907; and

"Whereas, his services as Director of the Laboratory have been of such splendid quality as to earn the unqualified approval and gratitude of the Board of Health; and

"Whereas, the Laboratory of Hygiene, under Dr. Shore's wise direction, has developed into a department which has gained national and international recognition; and

"Whereas, Dr. Shore is on leave of absence in attendance upon the International Rabies Conference being held under the auspices of the health section of the League of Nations by invitation of the Executive Officer of said League and by direction of the Surgeon-General of the United States; therefore,

"BE IT RESOLVED: That the State Board of Health express its deep appreciation for the services of Doctor Shore as Director of its Laboratory of Hygiene and record herewith its profound admiration of Doctor Shore as a man, and that these resolutions be recorded in the minutes of the Board of Health and a copy of same transmitted to Doctor Shore."

Each member of the Board expressed personal regret that Dr. Rankin had felt it necessary to resign as member of the Board and upon motion, a committee consisting of Dr. Way, Dr. Thompson and Dr. Crowell was named to draft the following resolutions which were unanimously adopted:

"Whereas Dr. W. S. Rankin, who for 16 years as Secretary of the State Board gave to the State of North Carolina distinguished constructive service in the field of Public Health, later serving since October 1st, 1926, as a member of this Board, has now felt impelled for geographical considerations to resign his membership thereon to the end that there may be made a fuller representation of the Board from the profession in the eastern section of the State, we feel constrained, therefore, after accepting his resignation with regret, to write upon our records our deep sense of his personal worth, our admiration of his devotion and wisdom in matters of public health and of his unparelled service for the welfare of the people of the State, and our abiding affection for him as a man—a faithful ardent life of highest human interests and ideals, finding happiness in the clear knowledge that 'Wisdom is the lamp of the soul, and love is the oil of its lamp.'

"Doctor Rankin claimed the privilege of making the last motion before the Board, namely, 'that the Board do now adjourn'."

CHAS. O'H. LAUGHINGHOUSE,

Secretary.

ANNUAL REPORT OF THE SECRETARY OF THE NORTH CAROLINA STATE BOARD OF HEALTH

DURHAM, N. C., APRIL, 1927.

Mr. President and members of the conjoint session of the Medical Society of the State of North Carolina and the North Carolina State Board of Health.

I am herewith submitting the annual report from the North Carolina State Board of Health to the Medical Society of the State of North Carolina as required by law.

One hundred and sixty-three years ago the entire public health activities of North Carolina functioned under a law which located officials at Fort Johnson, before whom masters of ships were required to testify regarding the existence of distempers on board their crafts. Ships infested with disease were ordered to cast anchor off Battery Island where the sick were cared for and after forty days, the commander of the ship was allowed to enter his boat, wash its hold with vinegar and smoke it with brimstone. Ninety-five years later an act was passed incorporating the Medical Society of the State of North Carolina. Eighteen years later, just fifty years ago, at the instigation of the medical profession of the State, the General Assembly gave the Medical Society the power to act as the State Board of Health.

Guided by the watchful wisdom and integrity of loyal predecessors through a period of half a century, this organization of yours has grown from a small institution, sustained by an annual appropriation of \$200.00, to a department, professional and State, investing this year nearly a half million of dollars in the fight which assists medicine and medical men in the lengthening of life and the prevention of disease.

The history of North Carolina's Board of Health reads into the records of the profession of the State, a veritable romance, resplendent with achievement.

Its story is the story of heredity in that it records the quality, foresight, wisdom and power of direction of the State's profession.

Out of the profession's loins the Board was begotten. Out of the State's womb it was born and by the profession's paternalism and support coupled with the maternity of the State it has developed and has been sustained.

The Board's history, the Board's achievement, the Board's policies, are nothing more nor less than the diary of a dependent but obedient child growing to a status of great strength because in its conduct it has never departed from parental obligation and parental authority.

The respective bureaus of the Board, bureaus which have been added from time to time as conditions have demanded, are functioning satisfactorily. Contagious and infectious disease control compares favorably with the rest of the country, medical inspection of schools is progressing as formerly, maternity and infancy hygiene is becoming more popular every day, malaria control presents a good report and other special units of endeavor are being actively and successfully carried on.

The legislature, which convened in January last and adjourned in March, finally endorsed the recommendations of the Advisory Budget Commission with relation to the financial allowance as originally submitted by the Board of Health.

It passed an amendment to the Sanitary Privy Law making the architecture and structure of sanitary privies more nearly optional with the owner than mandatory with the Board of Health. This amendment did not disturb the applicability of the law, however, so far as its purposes and power for preventing disease through the construction of sanitary privies is concerned.

It changed the salary limit of the executive officer of the Board from five to eight thousand dollars.

It passed a Sanitary District Bill, which is essentially an act enabling districts in the State, upon petition of fifty-one per cent of the free-holders

of that district to formulate sanitary areas for the purpose of carrying out sanitary undertakings. Industrial corporations or companies, and incorporated municipalities are included in these sanitary districts only upon approval of the governing body of the industrial corporations or municipalities.

Statements made on the floor of the Senate and statements published in the press relating to graft, and proven graft, within the Board were such as to require a request for an investigation of charges preferred. The executive officer of the Board requested the Governor to direct the Attorney-General to make a prompt and thorough investigation looking to the proof or denial of these charges. The result of the investigation as reported by the Attorney-General is as follows:

On April 15th, in a letter to Governor McLean, Attorney-General Brummitt makes this statement, "I informed Doctor John B. Wright and Senator Rivers D. Johnson of your request that I enter upon this inquiry. Neither has submitted to me any charges of graft against the State Board of Health or any of its officers, members or employees, nor any evidence upon which an investigation could proceed."

The Attorney-General further states that "Senator Woltz disclaimed any idea of charging graft, but that he did express the view that the inspectors of the Bureau had required a too exact conformance to the plans and specifications of such buildings." In other words, Senator Woltz's complaint would indicate that he disapproved of any system that would bring about efficiency in the execution of the law.

The Attorney-General states in his letter to the Governor that "no charges of graft have been filed; that no information involving the State Board of Health or any of its officers, members or employees in graft has been presented, and that he is without material upon which to proceed with the investigation."

In order that this conjoint session and the profession of the State may have an idea of the next long step looking to the extension of life and the prevention of disease, it should be called to your attention that cancer, heart, kidney and circulatory diseases are increasing alarmingly. The prevention of these degenerative diseases has resolved itself into an individual problem. Frequent and careful physical examinations followed by such advice and treatment as is applicable to the individual case is the only way to reduce the death rate caused by the above mentioned diseases. Being an individual problem, it must be dealt with conjointly by and through an alliance between the medical practitioners of North Carolina and the North Carolina State Board of Health.

Your Board of Health purposes to stimulate a genuine interest in annual and semi-annual physical examinations, provided the undertaking meets the approval of the profession in the State. With this in view, it is asking your endorsement and it is asking that your direct your incoming President to appoint a committee to confer with the Board of Health looking to the completion of an agreeable, workable plan which will inform the public and influence the people to an appreciation of the importance of such practice.

The Board of Health is converted to the opinion that physical examinations of the people of the State should be made by the physicians of the State and if the Medical Society approves it purposes to give all publicity to the importance of physical examination and to do everything else in its power to assist the profession to meet the demands which annual and semi-annual examinations will make upon it both collectively and individually.

Hitherto, there has not been established a clean-cut, always visible line agreed upon by the Board of Health on the one side and the physicians in active practice on the other, the line giving definition to the confines of the specialty of preventive medicine, if specialty it is.

Do we need definite expressions whereby the profession in a given community will be enabled to say to the Board of Health, "Thus far shalt thou go, and no further?"

Shall it be agreed that whatever the profession can do better than the State, that the profession should do?

Shall it be agreed that whatever the State or a group of private citizens in conjunction with the State can do better than the profession is doing, that the State should do, e'en though it infringes a bit on the preserves of curative medicine?

The executive officer of the Board of Health is requesting that your President direct your committee on public health administration to formulate a definite policy regarding this problem and submit said policy to your house of delegates for adoption.

Your present executive was inducted into office October 1, 1926. For sixteen years prior to the assumption of his present duties he has been in close touch with your Board of Health's activities, having been a member of the Board since 1911. Since 1893 he has given his entire time to the practice of general medicine. His acquaintance with the activities of the Board, the Medical Society, and the Profession, coupled with a personal experience in nearly every phase of the medical man's life will, it is to be hoped, compensate in part for a lack of academic training in the specialty of public health which, after all, is necessary more particularly to the execution of details.

An intimate acquaintanceship with the problems, satisfactions, dissatisfactions, pleasures, pains, purposes and emoluments of medical men, through the actual doing of their day's work, has begotten in the heart of your executive officer a deep regard, a sense of companionship in arms, a consideration, a respect for, and above all, a loyalty to the medical profession which will force him to keep an undivided faith with medical men in active practice in North Carolina. May he ask your assistance? May he depend upon your indulgence? May he feel the protection and the confidence which should abide with him through your patient coöperation? May he remind you now that the problems of infection and contagion are fairly well in hand; that the other diseases of infancy, childhood, youth, middle age and senility can be handled in no way save through the alliance of the Board of Health and the entire profession of the State. Medical advancement has brought us to where there can be no parting of the ways. Preventive medicine and curative medicine, public health workers and private practitioners must all hang together or they will hang separately.

*"For this is the Law of the Jungle—as old and as true as the sky;
And the Wolf that shall keep it may prosper, but the Wolf that shall
break it must die.
As the creeper that girdles the tree-trunk, the Law runneth forward
and back—
For the strength of the Pack is the Wolf, and the strength of the
Wolf is the Pack."*

BOARD MEETING

RALEIGH, N. C., MAY 11, 1927.

The Board met in called meeting Wednesday, May 11, 1927, 10:30 P.M., at the Sir Walter Hotel with President Way presiding and the following members present: Doctors Thompson, Anderson, Tucker, Wright, McDaniel and Mr. Stowe. Present by request was Dr. J. T. Burrus, President of the Medical Society of the State of North Carolina.

President Way stated that the meeting was called for the purpose of taking appropriate action with regard to the investigation of the administration of said privy law. He stated that the previous report of the Attorney-General of the State had not been considered complete and hence the House of Delegates of the State Medical Society had adopted certain resolutions urging the Governor to direct that the investigation be continued to the end that any person found guilty of such charges may be punished and the fair reputation of the North Carolina State Board of Health placed above reproach.

Dr. Cyrus Thompson thereupon placed before the Board the following resolution and moved its adoption. Upon second motion by Dr. Stanton, the resolution was unanimously adopted.

"Whereas, at a meeting of the Medical Society of the State of North Carolina, on April 20, 1927, a resolution was passed requesting the Governor to request the Attorney-General to give thorough investigation to the taking of graft by certain employees of the State Board of Health; and

"Whereas, the State Board of Health is unanimously in accord with the undertaking of this investigation; therefore,

"BE IT RESOLVED, First, that the Board of Health for the State of North Carolina do hereby express to the Attorney-General its deep appreciation for his prompt and courteous consideration of the resolution passed by the Medical Society of the State of North Carolina requesting him to investigate, with the full authority of his office, in order to ascertain if there be graft or other unlawful acts of omission or commission in the administration of the State-wide Sanitary Privy law.

"Second, that the Board of Health of the State of North Carolina hereby expresses its complete confidence in the fairness and ability of the Attorney-General and hereby tenders him its cordial, complete, individual and unanimous coöperation in the conduct of the investigation as attested by the attached signatures of every member of the Board.

"J. HOWELL WAY, *President*,
THOS. E. ANDERSON,
CYRUS THOMPSON,
D. A. STANTON,
E. J. TUCKER,
JAS. P. STOWE,
JNO. B. WRIGHT,
L. E. MCDANIEL,
A. J. CROWELL, proxy by President Way."

The Secretary read communications from Attorney-General Brummitt and from Governor McLean with regard to the investigation—the hearing to be begun on Thursday, May 12th.

Upon motion of Mr. Stowe the Board adjourned.

CHAS. O'H. LAUGHINGHOUSE,
Secretary.

BOARD MEETING

RALEIGH, N. C., AUGUST 23, 1927.

Pursuant to call by the President, the Board met in the executive offices at 10:30 A.M. with the following members present: Dr. Thomas E. Anderson, Dr. Cyrus Thompson, Dr. E. J. Tucker, Dr. A. J. Crowell, Dr. D. A. Stanton, Mr. James P. Stowe, Dr. John B. Wright and Dr. L. E. McDaniel.

Doctor Anderson moved that during the period that Dr. Way, President of the Board, is forced, through illness, to be absent from Board meetings that Dr. Cyrus Thompson be designated as president *pro tem* of the Board. Seconded by Dr. Crowell and unanimously carried.

The minutes of the annual meeting of the Board at Durham, April 19th and 20th and called meeting at Raleigh, May 11th, were read and upon motion of Dr. Wright, approved with following corrections: Home address of Dr. L. E. McDaniel, Jackson instead of Lasker; statement in letter of resignation of Dr. W. S. Rankin "and which bill was endorsed and advocated by Dr. John B. Wright, chairman of the Legislative Committee of the North Carolina State Medical Society" is mistaken in that he (Doctor Wright) neither endorsed nor advocated the passage of the Parker Bill referred to in the letter of resignation of Dr. Rankin.

The Secretary explained to the Board the highly satisfactory work being accomplished in the dental clinics for school children and upon motion of Dr. Tucker, the Board unanimously approved the resignation of Dr. J. C. Johnson as director of Oral Hygiene.

With regard to the investigation of the administration of the Sanitary Privy Law conducted by the Attorney-General of the State, the Secretary explained that this investigation had been completed after being carried out by the Attorney-General fairly and thoroughly, the Attorney-General endeavoring, insofar as humanly possible, to get every reflection of sentiment whether pertinent to the investigation or not. The Secretary stated that the report of the findings by the Attorney-General may be expected to be filed upon the return to the State of Governor McLean.

The Secretary presented the following telegram from the President of the Board:

"ASHEVILLE, N. C., AUGUST 23, 1927.

"State Board of Health,
Raleigh, N. C.

"GREETINGS WITH YOU IN SPIRIT ALMOST IN BODY ONLY
MY GOOD DOCTOR PREVENTS.

"J. HOWELL WAY, *President.*"

The Secretary also read a personal letter from Dr. Way conveying the pleasing information that his physical condition is materially improved. Upon motion of Dr. Wright, seconded by Dr. Anderson, the Secretary was directed to send the following telegram to Dr. Way:

"RALEIGH, N. C., AUGUST 23, 1927.

"Dr. J. Howell Way,
Care Highland Hospital,
Asheville, N. C.

"NORTH CAROLINA'S BOARD OF HEALTH, IN CONVENTION ASSEMBLED, IS WIRING ITS EXPRESSION OF SYMPATHY BECAUSE OF YOUR ILLNESS AND AT THE SAME TIME IT IS WIRING FELICITATIONS BECAUSE OF YOUR PROGRESSIVE RECOVERY STOP THE BOARD, INDIVIDUALLY AND COLLEC-

TIVELY, IS REGISTERING UNQUALIFIED ESTEEM, RESPECT AND CONFIDENCE.

"CHARLES O'H. LAUGHINGHOUSE,
"Secretary and State Health Officer."

Dr. J. H. Epperson, health officer of the city and county of Durham, with a delegation of Durham citizens consisting of R. W. Rigsby, City Manager; Col. S. C. Chambers, City Attorney; Mr. J. C. Michie, Superintendent of Water Department; Mr. A. P. Reade, Chairman Durham Fish Commission, and Mr. Wallace Seeman, appeared before the Board to present a request that the Board approve certain proposed rules and regulations with regard to permitting fishing in certain impounded waters in Durham county which serve as source of public water supply for the City of Durham. The proposed rules and regulations suggested for adoption by the Council of the City of Durham were presented as follows:

Be it Ordained by the City Council of the City of Durham, N. C.:

SECTION 1. There is hereby created the position of Game Warden. The employee who shall serve as Game Warden shall be chosen in the same manner and be under the same supervision as other employees of the Durham Water Department.

SEC. 2. It shall be the duty of the Game Warden:

(a) To strictly enforce all the rules and regulations approved by the Fish Commission and adopted by the City Council relative to fishing and boating on Lake Michie and to have general supervision of all city-owned property in connection with fishing and boating on said lake.

(b) To strictly enforce all the provisions of State and Local Public Health Laws which are now or may hereafter be enacted for the protection of the watershed and the impounding reservoir.

Rules and Regulations

SECTION 1. It shall be the duty of the Game Warden to inspect every catch of fish made in Lake Michie and to take up all such fish that are under the prescribed size or in excess of the prescribed number.

SEC. 2. It shall be the duty of the Game Warden to see that all privately owned boats are kept securely locked at all times when not in use.

SEC. 3. It shall be the duty of the Game Warden to see that no person shall in one day take more than ten (10) fish and where two or more persons are fishing from one boat, the combined catch of such persons shall not exceed twenty (20) fish. This rule does not apply to pike, catfish or round fish. Such daily catches of fish must not exceed three black bass and four rock bass (red-eye) per person.

SEC. 4. It shall be the duty of the Game Warden to see that fish are only taken with rod, line and hook, baited with natural bait or tied with flies (artificial) or with spoons or spinners, plugs or artificial minnows. The number of hook points on any line or tackle shall not exceed three, and shall consist of either one treble gang, or one doublegang and one single, or a combination of three single hooks.

SEC. 5. It shall be the duty of the Game Warden to see that no person shall sell, barter or exchange any fish taken out of Lake Michie while on the lake or before leaving same.

SEC. 6. Whenever any person fishing in Lake Michie, shall catch any bass or club less than (14) inches in length, any rock bass less than 8 inches in length or any perch less than 6 inches in length such person shall immediately return such fish to the water and permit the same to escape.

SEC. 7. Every privately-owned boat shall be kept at the fishing station of said Lake under the jurisdiction of the Game Warden and securely locked at all times when not in use and shall have the name of its owner or owners plainly marked thereon as conspicuously as practicable.

SEC. 8. No fishing permit or boat shall be valid when presented by any person except the original purchaser thereof; and when such permit is pre-

mented by any person except such purchaser, it shall be taken up by the Game Warden.

SEC. 9. No person shall violate any laws governing the pollution of public water supplies. A failure to observe this rule shall be sufficient cause for refusing to such person permission to go upon Lake Michie thereafter.

SEC. 10. No person may fire a gun or a pistol or a fire-cracker, or other fireworks from a boat on Lake Michie or from the shore.

SEC. 11. The period of sunset of March 15th to sunrise of June 15th in each year shall be the closed season; and during such time no person may fish in Lake Michie.

SEC. 12. Every permit, whether for fishing or keeping a boat in the lake, shall be subject to the conditions that it shall be revoked and taken up whenever the holder thereof has violated any of the rules and regulations governing fishing and boating in Lake Michie, or any of the restrictions attached to such permit, or has been guilty of conduct tending to impair the purity or sanitary conditions of the water in Lake Michie.

SEC. 13. A fishing permit good for use by one person for one day during the open season, Sundays excepted, shall be sold for 50 cents at the water office or Warden's office; yearly permit \$10.00 sold at office only.

SEC. 14. A permit to keep a boat in the lake will be sold at the water department office only, for \$10.00 per year, but only to the owner or owners of such boat. Not more than two persons will be recognized as the owners of any boat, and each of such owners must take out a boat permit in his own name. No boat may be used in Lake Michie by any person not the holder of a valid permit therefor, unless such person is accompanied by the owner of such permit.

SEC. 15. The charge for the use of any boat carrying not more than two persons engaged in fishing shall be fifty cents for a day or any part of a day; and if more than two such persons be carried in any boat the charge for such time shall be one dollar.

SEC. 16. Boatmen using city boats may charge not more than \$1.50 for a half day's service or \$3.00 for a whole day's service.

SEC. 17. It shall be the duty of the Game Warden to designate the capacity of all boats on the lake and further it shall be his duty to require each person entering a boat to be supplied with an approved life preserver.

SEC. 18. No fishing or boating will be permitted on Lake Michie before sunrise or after sunset.

SEC. 19. All fishing in Lake Michie shall be from boat and in no instance shall hook fishing or picnicing on watershed be permitted and no person will be permitted to leave or enter a boat other than from the city dock.

SEC. 20. The Fish Commission is hereby given authority to amend or alter these regulations pending the approval of the City Council.

The proposal was discussed in detail by Mr. Chambers, Mr. Rigsby, Doctor Epperson and Mr. Miller, sanitary engineer of the Board. Upon motion of Doctor Wright, seconded by Doctor Tucker, the following resolutions were unanimously adopted:

"Whereas, Dr. J. H. Epperson, City and County Health Officer of Durham, Mr. Rigsby, City Manager of Durham, and other members of the Durham Fish Commission, appeared before the Board requesting such action of Board as might be necessary to validate proposed ordinances of the City of Durham and of Durham County Health Department permitting, regulating and controlling fishing on Lake Michie the source of Durham's water supply, and

"Whereas, it is recognized that with the increasing development of water storage reservoirs as sources of water supplies in the State, amendments to the Board's existing rules controlling water supply sources may become necessary; now

"THEREFORE BE IT RESOLVED that the Board of Health does hereby authorize and approve fishing in Lake Michie under such rules and regulations of the City of Durham and Durham County Health Department as

may be approved by the Secretary of the North Carolina State Board of Health and the Attorney-General.

"It is resolved further that copies of this resolution be transmitted to Dr. J. H. Epperson, City and County Health Officer of Durham, and Mr. Rigsby, City Manager of Durham."

The Secretary reported to the Board that one of the buildings of the old Blind Institute is in course of rehabilitation and upon completion the offices of the Board will be removed there by direction of the Buildings and Grounds Commission. It was stated that the remodeling of the building is expected to be finished about January first and that the entire building is being assigned to the uses of the Board. Upon motion of Dr. Crowell, seconded by Dr. Stanton, the Board approved as the name of the building "The Health Building."

The Secretary reported the establishment of a division of Epidemiology effective as of July first under the direction of Dr. H. A. Taylor, formerly of the staff of the International Health Board, who has been loaned for service in North Carolina during the past five years. To succeed Dr. Taylor as director of the division of Maternity and Infancy, Dr. George Collins, formerly assistant director of that bureau, was promoted to be director.

The Secretary explained to the Board a proposed plan which he has in mind of attempting intensive training for county health officers by personal visitation on the part of members of the executive staff.

The Secretary presented to the Board for its consideration and appropriate action the matter of a proposed sanitary district located in Henderson County to be designated "Druid Hills Sanitary District," the same to be established in accordance with provisions of Chapter 100, Public Laws of North Carolina, Session of 1927. The Secretary presented to the Board the following documents in re said sanitary district:

1. Letter from Mr. J. O. Houston, Chairman Henderson County Board of Commissioners, transmitting petition of citizens of proposed sanitary district.

"HENDERSONVILLE, N. C., JUNE 30, 1927.

"The State Board of Health,
Raleigh, N. C.

Attention Mr. H. E. Miller, Director

"Dear Sir and Sirs:

"We have received a petition signed by more than fifty-one per cent of the resident freeholders of the territory described therein, asking that the territory described be created into a sanitary district to be known as: 'Druid Hills Sanitary District.' We have approved the petition and have ordered that our Chairman, Mr. J. O. Houston, transmit the petition to the State Board of Health, with the request that the proposed sanitary district be created. We herewith transmit to you the petition and request that the proposed sanitary district be created.

BOARD OF COUNTY COMMISSIONERS
OF HENDERSON COUNTY.

By J. O. HOUSTON,
Chairman."

2. Petition to Henderson County Board of Commissioners of citizens of proposed sanitary district.

TO THE HONORABLE BOARD OF COMMISSIONERS OF
HENDERSON COUNTY, NORTH CAROLINA:

We, the undersigned, constituting fifty-one per cent or more of the resident freeholders within a proposed sanitary district, the metes and bounds of which are hereafter set forth, do hereby petition your Honorable Body as follows:

1. To create and establish a sanitary district comprising said territory, under the provisions of an act of the General Assembly of North Carolina, entitled "AN ACT TO ENABLE THE CREATION, GOVERNMENT, MAINTENANCE AND OPERATION OF SANITARY DISTRICTS AND PRESCRIBING THE POWERS OF SUCH DISTRICTS."

2. That the boundaries of said sanitary district are as follows:

BEGINNING at a stake in the West margin of Ridgewood Avenue, which stake stands North 3° 45' East 640.5 feet from the intersection of the East margin of Ridgewood Avenue with the North margin of the Mills River Road, being the Northeast corner of lot No. 296 of the Druid Hills Subdivision as shown on plat thereof recorded in Plat Book 2, page 134, of the records of plats of Henderson County, and runs thence with the North margin of lot No. 296 North 85° 32' West 83 feet to an iron stake; thence South 4° 200' West 477.3 feet to the Northwest corner of lot No. 285 as shown by plat recorded in Plat Book 2, page 134 of the records of plats for Henderson County; thence South 3° 51' West 132.7 feet to a stake in the North margin of the Mills River Road; thence with the North margin of the Mills River Road South 66° 40' East to a point where the North margin of the Mills River Road intersects with the South margin of Ashwood Road, which intersection is as shown by Plat Book 1, page 105, of the Henderson County Records of Plats; thence with the South margin of the Ashwood Road South 84° 39' West to a stake where the South margin of the Ashwood Road intersects the West margin of Druid Hills Avenue; thence South 40° 30' East to the center of Britain's Creek; thence down and with the center of said creek in a Northeasterly direction and Northerly direction to Saluda Creek, known as Meadow Brook; thence with Meadow Brook in a Westerly direction to the Hendersonville-Asheville Highway; thence in a Northerly direction leaving the New Asheville Highway, following the old Asheville Road to the point where the old Asheville Road turns back into the new Asheville-Hendersonville Highway; thence Northerly with the new Asheville Highway to the point of intersection of said highway with Stoney Mountain Drive; thence North 69° 20' West with Stoney Mountain Drive as shown on page 189, Plat Book 2, of the records of plats of Henderson County, to the North corner of lot No. 615 as shown on said plat, it being the North corner of a tract of land conveyed by H. H. Carson to the Hendersonville Real Estate Company; thence South 6° 20' West to a creek that flows into Lake Somerset; thence in a South and Southeasterly direction with said creek to the North corner of tract of land conveyed by John Ewbank to the Hendersonville Real Estate Company, it being the North corner of lot No. 478 as shown on plat recorded in Plat Book 2, at page 189, of the records of plats of Henderson County; thence with the Ewbank line South 4° 28' West to a stone corner; thence South 65° 0' East 369 feet to a stone corner in the South margin of Briarwood Lane; thence South 2° 56' West to the North margin of an old road, shown as Highgate Road on page 59, Book 2, of the records of plats of Henderson County; thence with the North margin of said road South 85° 42' East 134 feet; thence in a North direction to an iron pipe in the South margin of Ferncliff Lane, the Northeast corner of lot No. 553; thence with the South margin of Ferncliff Lane South 87° 28' East 165.5 feet, the Northwest corner of lot No. 552; thence South 4° 18' West 265.3 feet to the North margin of Highgate Road, the Southwest corner of lot No. 557; thence with the North margin of Highgate Road South 85° 42' East 451 feet to the Southeast corner of lot No. 565 as shown on said plat; thence North 4° 18' East to an old corner, the Southwest corner of lot No. 460; thence South 85° 42' East to the East margin of an old road; thence North 4° 18' East to the bed stream of the branch flowing into Lake Somerset; thence with the Druid Hills property line as shown on Plat Book 1, at page 105, of the records of plats of Henderson County, a Southeastern

direction to a stake standing North 3° 56' East 53.6 feet from the North-west corner of lot No. 171 as shown on said plat; thence South 3° 56' West to the North margin of Highgate Road, extended; thence crossing the road to a stake at the Northeast corner of lot No. 154 as shown on page 105, Plat Book 1, of the records of plats of Henderson County; thence South 3° 16' West 153.6 feet to the old A. Sumney land; thence with the A. Sumney line South 86° 15' East to a stake in the West margin of Ridgewood Avenue; thence with the West margin of Ridgewood Avenue South 3° 45' West to the BEGINNING.

3. That objects proposed to be accomplished by the creation of said sanitary district are briefly as follows:

(a) For the purpose of preserving and promoting the public health and welfare of the territory embraced in said proposed district.

(b) That the said district may be a body corporate, and that a sanitary board, consisting of three members be appointed as a governing body of said district.

(c) In order that a complete sanitary sewer system may be established in said district under the provisions of said act for the proper preservation and promotion of the public health of said district, or an adequate and suitable water supply system may be obtained in said district.

(d) In order that the said district may avail itself of all of the privileges and powers contained in said special act of the General Assembly.

(e) That said sanitary district shall be known and designated as "Druid Hills Sanitary District," or such other appropriate name as your Honorable Board may deem proper.

Respectfully submitted,

W. C. MEEKINS

J. D. DUFF

MAY M. DUFF

J. T. FAIN

YATES W. LITTLE

T. L. WRIGHT

C. M. LEVETT

FRED BLUM

GEO. D. DAVIS

H. C. MARDIS

THOS. SHEPHERD

E. E. LANCE

B. V. LANCE

MRS. ANNIE H. SUMMERS

WM. R. RICHARD

HELEN E. RICHARD

WM. K. MCLEAN

MRS. BYRD

O. O. GRIFFIN

W. A. EGERTON

A. W. HONEYCUTT

C. S. FULLBRIGHT

H. H. CARSON

MRS. L. M. COLT

R. G. ANDERS

J. V. GOODRICH

MRS. V. W. TWYFORD

NATHAN FRED

C. D. WEEKS

MRS. R. E. TAYLOR

DR. R. E. TAYLOR

E. G. CREWS

GLADYS ROSS

MRS. LOUISE W. CLARKE

R. C. CLARKE

MARCIA C. MEEKINS

D. S. PACE

L. R. PLEMMONS

E. E. LOTT

ROY JOHNSON

CHAS. B. FRENCH

W. B. WILSON

P. E. ROLLINS

ALEX. B. DRYSDALE

O. M. BROWN

3. Certified copy Minutes of Henderson County Board of Commissioners of date May 23, 1927.

STATE OF NORTH CAROLINA,
COUNTY OF HENDERSON.

OFFICE OF BOARD OF COUNTY COMMISSIONERS

Commissioners met this May 23rd, according to recess of _____ all members present.

A petition was presented to Commissioners requesting a sanitary district be established in Druid Hills. By motion petition was filed and ordered that the chairman give notice by advertisement and otherwise as provided by law for a public hearing of same, to be held in the commissioners room at County Court House Saturday, June 25th, at 10 A.M.

The above described petition to the Board of Commissioners of Henderson County, North Carolina, requested the establishment of the territory described therein as a sanitary district, under the provisions of an act of the General Assembly of North Carolina entitled "An Act to enable the creation, government, maintenance, and operation of sanitary districts and prescribing the power of such districts," and further asking that the said proposed sanitary district be known and described as "Druid Hills Sanitary District" or such other appropriate name as the Board may deem proper, was presented and filed with the Board.

The above petition was signed by a great number of individuals purporting to be resident freeholders within the territory described in the petition, and upon request of proof, it was shown to the satisfaction of the Board that those whose names were signed to the petition constituted more than 51% of all the resident freeholders within the territory described in the petition.

It was then ordered by the Board that a public hearing upon the matters contained in said petition be held in the County Commissioners room of the County Court House, Hendersonville, North Carolina, at 10 o'clock A.M. Saturday, June 25, 1927; and further ordered that notices of the public hearing on said day at said place be given by the Chairman of the Board by publication of the said notice in the Hendersonville *Times-News*, a newspaper published in Hendersonville, Henderson County, North Carolina, for four consecutive weeks immediately preceding June 25, 1927; and further ordered by the Board that a copy of the notice of the said public hearing upon the matters contained in said petition for the creation of the said district to be posted at the Court House door, Hendersonville, North Carolina, for thirty consecutive days immediately preceding June 25, 1927.

Recessed to meet May

J. O. HOUSTON, *Chairman*,
W. T. DRAKE, *Clerk*.

STATE OF NORTH CAROLINA,
COUNTY OF HENDERSON.

I, W. T. Drake, Register of Deeds, in and for the above named State and County, do hereby certify that the foregoing is a true and correct copy of the minutes of meeting of the County Commissioners of Henderson County, as appears in Minute Book 10, at page 300A, of the Records of Minutes of the County Commissioners of Henderson County, North Carolina.

Witness my hand and seal, this July 15th, 1927.

W. T. DRAKE,
Register of Deeds.

4. Supporting affidavit of Messrs. J. D. Duff and W. C. Meekins.

NORTH CAROLINA,
HENDERSON COUNTY.

J. D. Duff and W. C. Meekins, being first duly sworn, depose and say:

That affiants are resident freeholders within the territory described in a petition filed before the Board of County Commissioners of Henderson County requesting the creation thereof into a sanitary district to be known as "Druid Hills Sanitary District," or such other appropriate name as the said Board may deem proper, and that they are acquainted with the resident freeholders within said territory; that the names of those persons signed to said petition are signed by resident freeholders within said territory and that those signing constitute more than fifty-one per cent (51%) of all the resident freeholders within said district.

J. D. DUFF,
W. C. MEEKINS.

NORTH CAROLINA—Henderson County.

Sworn and subscribed to before me this June 25th, 1927.

J. S. JONES, *Asst. C. S. C.*

5. Certified copy resolution Henderson County Board of Commissioners of May 23, 1927.

Whereas in the meeting of the Board of County Commissioners of Henderson County held at the Court House at ____ o'clock A.M., on the 23rd day of May, 1927, a petition was presented and filed with this Board requesting the establishment of the territory described therein into a sanitary district as provided for the establishment of such districts by Chapter 100 of the Public Laws of 1927 of the State of North Carolina, entitled "An Act to enable the creation, government, maintenance and operation of sanitary districts and prescribing the power of such districts," the said petition requesting that the proposed sanitary district be known as the "Druid Hills Sanitary District" or such other appropriate name as the Board may deem proper; and whereas it was ascertained by the Board of County Commissioners of Henderson County that the said petition as presented and filed was signed by more than 51% of the resident freeholders within the territory described in the said petition; and whereas in said meeting the Board of Commissioners ordered that a public hearing be held upon the matter of establishing the said district, at the County Court House, Hendersonville, North Carolina, at 10:00 o'clock A.M., Saturday, June 25th, 1927; and whereas the Board of Commissioners authorized and ordered the Chairman of said Board, namely, J. O. Houston, to give notice of the public hearing upon the matter as aforesaid by publication for four successive weeks immediately preceding the day of said hearing in the Hendersonville *Times-News*, a newspaper published in Hendersonville, Henderson County, North Carolina, and the said Board further ordering that a copy of the notice relative to the public hearing as aforesaid be posted at the Court House door, Hendersonville, North Carolina, for thirty consecutive days preceding June 25, 1927, all as prescribed by Chapter 100 of the Public Laws of 1927, relating thereto;

And, whereas, the public hearing as advertised and as aforesaid was held in the room of the County Commissioners of Henderson County, in the Court House, at Hendersonville, North Carolina, at 10:00 o'clock A.M., Saturday, June 25, 1927, upon the matter of establishing the said Druid Hills Sanitary District; and whereas at said meeting several resident freeholders of the proposed sanitary district were present; and whereas it was ascertained to the satisfaction of the Board by affidavit of J. T. Fain, General Manager of the Hendersonville *Times-News*, and otherwise, that publication of the notice of hearing as sworn to in the said affidavit was published for four successive weeks immediately preceding the day of the public hearing, namely, June 25, 1927, in the Hendersonville *Times-News*, a newspaper published in Hendersonville, Henderson County, North Carolina; and whereas it was ascertained to the satisfaction of the Board of affidavit of W. C. Meekins, and otherwise, that a copy of the notice of the said public hearing at the time and place contained in said notice was posted at the court house door, Hendersonville, North Carolina, for thirty consecutive days preceding June 25, 1927; and whereas it was again shown to the satisfaction of the Board that more than 51% of the resident freeholders within the proposed district has signed the petition requesting the creation of the Druid Hills Sanitary District; and whereas there was no opposition stated to the creation of the district as prayed for in the petition for the creation of the same;

NOW, THEREFORE, BE IT RESOLVED: That the Board of Commissioners approve the petition presented for the establishment of the territory described therein as a sanitary district, and that the name of the said district be "Druid Hills Sanitary District."

AND BE IT FURTHER RESOLVED that the Chairman of this Board of County Commissioners, namely, J. O. Houston, do transmit a copy of this resolution, together with the petition presented and filed for the creation of the said Druid Hills Sanitary District, to the State Board of Health, at Raleigh, North Carolina, with the request of this Board that the proposed sanitary district be created.

NORTH CAROLINA,
HENDERSON COUNTY.

I, W. T. Drake, Register of Deeds in and for the above named State and County, do hereby certify that the foregoing "Resolution of June 25th,

1927, relative to Druid Hills Sanitary District" is a true and correct copy from the minutes of a meeting of the County Commissioners of Henderson County, State of North Carolina, on June 25th, 1927, as appears in Minute Book 10, at page 306, of the Records of Minutes of the County Commissioners of Henderson County.

Witness my hand and seal, this July 15th, 1927.

SEAL

W. T. DRAKE,
Register of Deeds.

6. Official designation of H. E. Miller as agent of the State Board of Health to hold public hearing on August 6th, 1927.

RALEIGH, N. C., JULY 12, 1927.

Mr. H. E. Miller, Director
Bureau of Sanitary Engineering,
State Board of Health,
City.

Dear Mr. Miller:

In reply to yours of even date with reference to the submission of Druid Hills Sanitary District petition and the public hearing which is required to be held by a representative of the State Board of Health under the provisions of Chapter 100, Public Laws of 1927, you are hereby directed to take the necessary steps as required by Section 4, Chapter 100, Public Laws of 1927, for the publication of notice of public hearing tried within the Druid Hills Sanitary District on Saturday, August 6th, and you are further directed to appear at this hearing for and as the agent of the State Board of Health to take note of such reasons as may be advanced for or against the formation of the sanitary district as provided for in the petition aforementioned and to report such findings to the State Board of Health at such time as may be further directed.

Very truly yours,
(Signed) CHAS. O'H. LAUGHINGHOUSE,
State Health Officer.

7. Copy of notice of public hearing published in The Hendersonville *Times-News*.

NOTICE

TO ALL CITIZENS, RESIDENTS, TAXPAYERS AND OTHER PERSONS INTERESTED IN THE CREATION OF A PROPOSED SANITARY DISTRICT IN HENDERSON COUNTY DESIGNATED IN A PETITION AS "DRUID HILLS SANITARY DISTRICT."

TAKE NOTICE that a petition has been filed with the Board of Commissioners of Henderson County, signed by more than fifty-one per cent of the resident freeholders residing in a proposed sanitary district, the territory of which is described as follows:

BEGINNING at a stake in the West margin of Ridgewood Avenue, which stake stands North 3° 45 min. East 640.5 feet from the intersection of the East margin of Ridgewood Avenue with the North margin of the Mills River road, being the Northeast corner of lot No. 296 of the Druid Hills Subdivision as shown on plat thereof recorded in Plat Book 2, page 134, of the Records of Plats of Henderson County, and runs thence with the North margin of lot No. 296 North 85° 32 min. West 83 feet to an iron stake; thence South 4° 02 min. West 477.3 feet to the Northwest corner of lot No. 285 as shown by plat recorded in Plat Book 2, page 134, of the Records of Plats for Henderson County; thence South 3° 51 min. West 132.7 feet to a stake in the North margin of the Mills River road; thence with the North margin of the Mills River road South 66° 40 min. East to a point where the North margin of the Mills River road intersects with the South margin of Ashwood road, which intersection is as shown by Plat Book 1, page 105, of the Henderson County Records of Plats; thence with the South margin of the Ashwood road South 84° 39 min. West to a stake where the South margin of the Ashwood road intersects the West margin of Druid Hills Avenue; thence South 40° 30 min. East to the center of Brittain's Creek; thence down and with the center of said creek in a

Northeasterly direction and Northerly direction to Saluda Creek, known as Meadow Brook; thence with Meadow Brook in a Westerly direction to the Hendersonville-Asheville Highway; thence in a Northerly direction leaving the New Asheville Highway, following the old Asheville road to the point where the old Asheville road turns back into the new Asheville-Hendersonville Highway; thence Northerly with the new Asheville Highway to the point of intersection of said highway with Stoney Mountain Drive; thence North $69^{\circ} 20$ min. West with Stoney Mountain Drive as shown on page 189, Plat Book 2, of the Records of Plats of Henderson County, to the North corner of lot No. 615 as shown on said plat, it being the North corner of a tract of land conveyed by H. H. Carson to the Hendersonville Real Estate Company; thence South $6^{\circ} 20$ min. West to a creek that flows into Lake Somerset; thence in a South and Southeasterly direction with said creek to the North corner of tract of land conveyed by John Ewbank to the Hendersonville Real Estate Company, it being the North corner of lot No. 478 as shown on plat recorded in Plat Book 2, at page 189, of the Records of Plats of Henderson County; thence with the Ewbank line South $4^{\circ} 28$ min. West to a stone corner; thence South $65^{\circ} 0$ min. East 369 feet to a stone corner in the South margin of Briarwood Lane; thence South $2^{\circ} 56$ min. West to the North margin of an old road, shown as Highgate road on page 59, Book 2, of the Records of Plats of Henderson County; thence with the North margin of said road South $85^{\circ} 42$ min. East 134 feet; thence in a North direction to an iron pipe in the South margin of Ferncliff Lane, the Northeast corner of lot No. 553; thence with the South margin of Ferncliff Lane South $87^{\circ} 28$ min. East 165.5 feet, the Northwest corner of lot No. 552; thence South $4^{\circ} 18$ min. West 265.3 feet to the North margin of Highgate Road, the Southwest corner of lot No. 557; thence with the North margin of Highgate Road South $85^{\circ} 42$ min. East 451 feet to the Southeast corner of lot No. 565 as shown on said plat; thence North $4^{\circ} 18$ min. East to an old corner, the Southwest corner of lot No. 460; thence South $85^{\circ} 42$ min. East to the East margin of an old road; thence North $4^{\circ} 18$ min. East to the bed stream of the branch flowing into Lake Somerset; thence with the Druid Hills property line as shown on Plat Book 1, at page 105, of the Records of Plats of Henderson County, a Southeastern direction to a stake standing North $3^{\circ} 56$ min. East 53.6 feet from the Northwest corner of lot No. 171 as shown on said plat; thence South $3^{\circ} 56$ min. West to the North margin of Highgate Road, extended; thence crossing the road to a stake at the Northeast corner of lot No. 154 as shown on page 105, Plat Book 1, of the Records of Plats of Henderson County; thence South $3^{\circ} 16$ min. West 153.6 feet to the old A. Sumney land; thence with the A. Sumney line South $86^{\circ} 15$ min. East to a stake in the West margin of Ridgewood Avenue; thence with the West margin of Ridgewood Avenue South $3^{\circ} 45$ min. West to the BEGINNING.

A meeting of the Board of Commissioners of Henderson County will be held at the office of said Board at ten o'clock A.M., on the 25th day of June, 1927, upon the question of the advisability or necessity for the creation of said district. The purpose for the creation of said district is briefly as follows:

(a) For the purpose of preserving and promoting the public health and welfare of the territory embraced in said proposed district.

(b) That the said district may be a body corporate, and that a sanitary board, consisting of three members be appointed as a governing body of said district.

(c) In order that a complete sanitary sewer system may be established in said district under the provisions of said act for the proper preservation and promotion of the public health of said district, or an adequate and suitable water supply system may be obtained in said district.

(d) In order that the said district may avail itself of all the privileges and powers contained in said special act of the General Assembly.

At said hearing all persons interested or affected by the creation of said proposed district are hereby invited to appear before said Board of Commissioners of said County of Henderson on said date and enter any objections which they may have as to the creation and establishment of said sanitary district, and also present such evidence or information as they

desire in order that the said Board of Commissioners may be fully informed as to the necessity and advisability for the creation and establishment of said district.

Said hearing and proceedings thereunder are pursuant to an act of the General Assembly entitled "AN ACT TO ENABLE THE CREATION, GOVERNMENT, MAINTENANCE AND OPERATION OF SANITARY DISTRICTS AND PRESCRIBING THE POWERS OF SUCH DISTRICTS," ratified March 4, 1927.

By order of the Board of Commissioners of Henderson County, North Carolina. This the 23rd day of May, 1927.

J. O. HOUSTON, *Chairman*,
Board Comm. of Henderson County.

8. Affidavit of publication of notice of public hearing.

STATE OF NORTH CAROLINA.

COUNTY OF HENDERSON.

AFFIDAVIT OF PUBLICATION

Personally appeared before me J. T. Fain, General Manager, of the Hendersonville *Times-News*, a newspaper published in the city of Hendersonville, county and State aforesaid, who being duly sworn states that the NOTICE OF DRUID HILLS SANITARY DISTRICT in the case of _____ copy of which is attached, was inserted in the *Times-News* in its issues of May 25, 1927, and once a week thereafter until a total of four insertions had been given.

J. T. FAIN, (Seal)
General Manager.

Sworn and subscribed to before me this 25th day of June, 1927.

H. B. GRASON, (Seal)
Justice of the Peace.

9. Supporting affidavit of publication of notice of public hearing.

NORTH CAROLINA,

HENDERSON COUNTY.

W. C. Meekins, being first duly sworn, deposes and says:

That affiant is a resident of Henderson County, North Carolina; that a NOTICE "To all citizens, residents, taxpayers and other persons interested in the creation of a proposed sanitary district in Henderson County designated as "Druid Hills Sanitary District," copy of which is attached hereto and copy of same notice published in the *Times-News* as sworn to by J. T. Fain, General Manager thereof, was posted at the Court House, Hendersonville, Henderson County, North Carolina, on May 23, 1927, and remained there posted to and until June 25, 1927.

W. C. MEEKINS.

Sworn and subscribed to before me, this 25th day of June, 1927.

H. B. GRASON,
Justice of the Peace.

10. Copy of notice of hearing before State Board of Health published in the Hendersonville *Times-News*.

NOTICE

TO ALL CITIZENS, RESIDENTS, TAXPAYERS AND OTHER PERSONS INTERESTED IN CREATION OF A PROPOSED SANITARY DISTRICT IN HENDERSON COUNTY, DESIGNATED IN A PETITION AS "DRUID HILLS SANITARY DISTRICT."

TAKE NOTICE that a petition has been transmitted to the State Board of Health by the Board of Commissioners of Henderson County, requesting that the proposed sanitary district described therein be created, which petition is signed by more than 51 per cent of the resident freeholders described in the proposed sanitary district, the territory of which is described as follows:

BEGINNING at a stake in the West margin of Ridgewood Avenue, which stake stands North 3° 45 min. East 640.5 feet from the intersection of the East margin of Ridgewood Avenue with the North margin of the Mills River road, being the Northeast corner of lot No. 296 of the Druid Hills Subdivision as shown on plat thereof recorded in Plat Book 2, page 134, of the Records of Plats of Henderson County, and runs thence with the North margin of lot No. 296 North 85° 32 min. West 83 feet to an iron stake; thence South 4° 02 min. West 477.3 feet to the Northwest corner of lot No. 285 as shown by plat recorded in Plat Book 2, page 134, of the Records of Plats for Henderson County; thence South 3° 51 min. West 132.7 feet to a stake in the North margin of the Mills River Road; thence with the North margin of the Mills River Road South 66° 40 min. East to a point where the North margin of the Mills River Road intersects with the South margin of Ashwood Road, which intersection is as shown by Plat Book 1, page 105, of the Henderson County Records of Plats; thence with the South margin of the Ashwood Road South 84° 39 min. West to a stake where the South margin of the Ashwood Road intersect the West margin of Druid Hills Avenue; thence South 40° 30 min. East to the center of Brittain's Creek; thence down and with the center of said creek in a Northeasterly direction and Northerly direction to Saluda Creek, known as Meadow Brook; thence with Meadow Brook in a Westerly direction to the Hendersonville-Asheville Highway; thence in a Northerly direction leaving the New Asheville Highway, following the old Asheville Road to the point where the old Asheville Road turns back into the new Asheville-Hendersonville Highway; thence Northerly with the new Asheville Highway to the point of intersection of said highway with Stoney Mountain Drive; thence North 69° 20 min. West with Stoney Mountain Drive as shown on page 189, Plat Book 2, of the Records of Plats of Henderson County, to the North corner of lot No. 615 as shown on said plat, it being the North corner of a tract of land conveyed by H. H. Carson to the Hendersonville Real Estate Company; thence South 6° 20 min. West to a creek that flows into Lake Somerset; thence in a South and Southeasterly direction with said creek to the North corner of tract of land conveyed by John Ewbank to the Hendersonville Real Estate Company, it being the North corner of lot No. 478 as shown on plat recorded in Plat Book 2, at page 189 of the Records of Plats of Henderson County; thence with the Ewbank line South 4° 28 min. West to a stone corner; thence South 65° 0 min. East 369 feet to a stone corner in the South margin of Briarwood Lane; thence South 2° 56 min. West to the North margin of an old road, shown as Highgate Road on page 59, Book 2, of the Records of Plats of Henderson County; thence with the North margin of said road South 85° 42 min. East 134 feet; thence in a North direction to an iron pipe in the South margin of Ferncliff Lane, the Northeast corner of lot No. 553; thence with the South margin of Ferncliff Land South 87° 28 min. East 165.5 feet, the Northwest corner of lot No. 552; thence South 4° 18 min. West 265.3 feet to the North margin of Highgate Road, the Southwest corner of lot No. 557; thence with the North margin of Highgate Road South 85° 42 min. East 451 feet to the Southeast corner of lot No. 565 as shown on said plat; thence North 4° 18 min. East to an old corner, the Southwest corner of lot No. 460; thence South 85° 42 min. East to the East margin of an old road; thence North 4° 18 min. East to the bed stream of the branch flowing into Lake Somerset; thence with the Druid Hills property line as shown on Plat Book 1, at page 105, of the Records of Plats of Henderson County, a Southeastern direction to a stake standing North 3° 56 min. East 53.6 feet from the Northwest corner of lot No. 171 as shown on said plat; thence South 3° 56 min. West to the North margin of Highgate Road, extended; thence crossing the road to a stake at the Northeast corner of lot No. 154 as shown on page 105, Plat Book 1, of the Records of Plats of Henderson County; thence South 3° 16 min. West 153.6 feet to the old A. Sumney land; thence with the A. Sumney line South 86° 15 min. East to a stake in the West margin of Ridgewood Avenue; thence with the West margin of Ridgewood Avenue South 3° 45 min. West to the BEGINNING.

TAKE NOTICE that on Saturday, August 6, 1927, at 10 o'clock A.M., and at the Druid Hills Guest House, which is the building sometimes called the Woman's Club House, it being located within the above described proposed sanitary district, the State Board of Health will hold a public hearing concerning the creation of the proposed sanitary district.

The purposes for the creation of said district are briefly set forth as follows:

(a) For the purpose of preserving and promoting the public health and welfare of the territory embraced in said proposed district.

(b) That the said district may be a body corporate, and that a sanitary board, consisting of three members be appointed as a governing body of said district.

(c) In order that a complete sanitary sewer system may be established in said district under the provisions of said act for the proper preservation and promotion of the public health of said district, or an adequate and suitable water supply system may be obtained in said district.

(d) In order that the said district may avail itself of all the privileges and powers contained in said special act of the General Assembly.

At said hearing all persons interested or affected by the creation of said proposed district are hereby invited to appear before the State Board of Health of the State of North Carolina on said date at said time and place and enter any objections which they may have as to the creation and establishment of said sanitary district, and also present such evidence or information as they desire in order that the said State Board of Health may be fully informed as to the necessity and advisability for the creation and establishment of said district.

Said hearing and proceedings thereunder are pursuant to an act of the General Assembly entitled "AN ACT TO ENABLE THE CREATION, GOVERNMENT, MAINTENANCE AND OPERATION OF SANITARY DISTRICTS AND PRESCRIBING THE POWERS OF SUCH DISTRICTS," ratified March 4, 1927.

By order of the State Board of Health of the State of North Carolina. This 15th day of July, 1927.

CHAS. O'H. LAUGHINGHOUSE,
Sec'y-Treas. and State Health Officer.

11. Affidavit of notice of hearing before State Board of Health.

STATE OF NORTH CAROLINA,

COUNTY OF HENDERSON.

AFFIDAVIT OF PUBLICATION

Personally appeared before me J. T. Fain, Manager of the Hendersonville *Times-News*, a newspaper published in the City of Hendersonville, county and State aforesaid, who being duly sworn states that the NOTICE TO CITIZENS, RESIDENTS AND TAXPAYERS OF DRUID HILLS SANITARY DISTRICT in the case of meeting with State Board of Health copy of which is attached, was inserted in *The Times-News* in its issues of July 17, 1927, and thereafter until a total of five insertions had been given, the last insertion being given on August 4, 1927.

J. T. FAIN, (Seal)
General Manager.

Sworn and subscribed to before me this 17th day of August, 1927.

SEAL

EMMETT E. LOTT, (Seal)
Notary Public.

My commission expires July 12, 1928.

12. Report of H. E. Miller, agent of the State Board of Health, of public hearing held August 6, 1927.

GENTLEMEN:

Pursuant to the directions of Dr. Chas. O'H. Laughinghouse, Secretary of the North Carolina State Board of Health, by letter under date of July 12th, I beg to respectfully submit the following report:

Under date of June 30, 1927, the Henderson County Board of Commissioners through its Chairman, Mr. J. O. Houston, transmitted to the State

Board of Health together with supporting documents a petition known as the "Druid Hills Sanitary District" petition signed by W. C. Meekins and others which was submitted to the Henderson County Board of Commissioners, in accordance with the provisions of Section 3, Chapter 100, Public Laws of 1927, requesting that a certain area to be known as the Druid Hills Sanitary District, therein described in detail, and located wholly within Henderson County be created and established as a sanitary district under the provisions of Chapter 100, Public Laws of 1927, "An Act to enable the Creation, Government, Maintenance and Operation of Sanitary Districts and prescribing the powers of such districts." This communication states that the Henderson County Board of Commissioners have approved the petition and transmit the same to the State Board of Health with the request that the proposed sanitary district be created.

The supporting documents include:

1. Affidavit by W. C. Meekins, setting forth that the names of persons signed to the petition are signatures of resident freeholders within the proposed sanitary district and that those signing constitute more than fifty-one per cent of all the resident freeholders within the proposed sanitary district.

2. Affidavit by W. C. Meekins relative to posting notice at Court House door and affidavit of J. T. Fain, general manager of the Hendersonville *Times-News*, to the effect that notice of hearing of Druid Hills Sanitary District petition by the Henderson County Board of Commissioners was inserted in the *Times-News* in its issues of May 25, 1927, and once a week thereafter until a total of four insertions had been given.

3. Copy of minutes of County Commissioner's meeting of Henderson County for the meeting of May 23, 1927, setting forth that on that date a petition was received requesting the formation of the "Druid Hills Sanitary District." That the Board found as a fact that the petition was signed by more than fifty-one per cent of all the resident freeholders in the territory described in the petition, that it was ordered that a public hearing of this petition be held at ten o'clock Saturday morning, June 25, 1927, and that notices of the public hearing on said day be published and posted on the Court House door as provided in Chapter 100, Public Laws of 1927.

4. A copy of the resolution adopted by the Henderson County Board of Commissioners on June 25th approving the Druid Hills Sanitary District petition and ordering that a copy of the resolution together with the petition for the creation of "Druid Hills Sanitary District" be forwarded to the State Board of Health, Raleigh, N. C., with the request that the proposed sanitary district be created.

Upon receipt of these documents as set forth above, Dr. Chas. O'H. Laughinghouse, Secretary of the State Board of Health was advised of their receipt by my letter of July 12th and by a letter of even date directed me to proceed with measures for giving suitable notice of public hearing as provided for in Section 4, Chapter 100, Public Laws of 1927, and to attend such hearing as an agent of the State Board of Health and to report the results and findings of such hearing to the State Board of Health.

Due notice of publication of public hearing by a representative of the State Board of Health of the formation of the proposed "Druid Hills Sanitary District" was made in the Hendersonville *Times-News* as set forth in an affidavit attached hereto by J. T. Fain, general manager of the Hendersonville *Times-News*, said affidavit being made under date of August 17, 1927.

In accordance with the notice of public hearing of the proposed "Druid Hills Sanitary District," published as set forth in the affidavit of J. T. Fain, under date of August 17, 1927, a public hearing was held at the Guest House in Druid Hills proposed sanitary district in Henderson County on Saturday, August 6th, ten A.M. The writer was present as an agent of the State Board of Health in accordance with the directions of Dr. Laughinghouse under date of July 12th.

On behalf of the citizens of Druid Hills, Mr. A. B. Drysdale, W. C. Meekins and other residents and freeholders of the proposed Druid Hills

Sanitary District advanced the need of the formation of the proposed Druid Hills Sanitary District and urgently requested that the State Board of Health give prompt and favorable action to the petition submitted.

Inasmuch as there was no opposition voiced by any one to the proposition of the formation of the proposed Druid Hills Sanitary District and inasmuch as there is serious and pressing need for the water supply and sewerage improvements contemplated if the proposed district is formed, and further, since the area embraced in the boundaries as described in the petition for the proposed Druid Hills Sanitary District is suitably situated for the installation of community water supply and sewerage service, it is respectfully recommended that this petition receive favorable action by the North Carolina State Board of Health.

Very truly yours,

(Signed) H. E. MILLER, *Director*,
Bureau of Sanitary Engineering.

August 22, 1927.

All of above documents in re proposed "Druid Hills Sanitary District," being before the Board and duly considered upon motion of Mr. J. P. Stowe, seconded by Dr. D. A. Stanton, the following resolution was unanimously adopted:

Whereas, a petition for the formation of the proposed "Druid Hills Sanitary District" submitted to the County Board of Commissioners of Henderson County was transmitted to the North Carolina State Board of Health with the approval and recommendations of the said Henderson County Board of Commissioners, and whereas the said petition was received at the office of the North Carolina State Board of Health at a time the State Board of Health was not in session, and

Whereas, further, Dr. Charles O'H. Laughinghouse, the Secretary of the North Carolina State Board of Health did, acting for the State Board of Health, under date of July 12th, issue directions to H. E. Miller, Director of the Bureau of Sanitary Engineering of the said Board of Health to proceed under the provisions of Chapter 100, Public Laws of 1927, with such steps as required under Section 4 of said Chapter 100 for the publication of notice of public hearing on the said "Druid Hills Sanitary District" petition as provided for in Section 4 of said Chapter 100, and

Whereas, Dr. Charles O'H. Laughinghouse did acting for the State Board of Health under the same date direct H. E. Miller to appear at said hearing for and as the agent of the said Board of Health, and

Whereas, further, Dr. Charles O'H. Laughinghouse, Secretary of the said State Board of Health, did through the said H. E. Miller cause to have published in the Hendersonville *Times-News* in accordance with the provisions of Section 4, Chapter 100, public notice of public hearing upon the said "Druid Hills Sanitary District" petition to be held in Druid Hills, Henderson County on Saturday, August 6th, now

THEREFORE, BE IT RESOLVED that the North Carolina State Board of Health, this day in session, does authorize and approve the foregoing as an act of the North Carolina State Board of Health.

RESOLVED, further, that this resolution be spread upon the minutes of the North Carolina State Board of Health as a part of the official record of transactions of the North Carolina State Board of Health with reference to the proposed "Druid Hills Sanitary District."

Thereupon the following resolution formally creating the "Druid Hills Sanitary District" under and by virtue of Chapter 100, Public Laws of North Carolina, session of 1927, was presented by the Secretary, and upon motion of Dr. A. J. Crowell, seconded by Dr. E. J. Tucker, the same was unanimously adopted:

The North Carolina State Board of Health assembled in Special Session at Raleigh, this the 23rd (twenty-third) day of August, 1927, has reviewed the petition for the formation of a sanitary district to be known as the "Druid Hills Sanitary District," the same being located in Henderson County, North Carolina, and bounded as hereinafter set forth.

Whereas, upon review of the said petition with affidavits of W. C. Meekins and W. T. Fain, and certified copies of extracts from the minutes of meetings of the Henderson County Board of Commissioners, it appears that more than fifty-one per cent of the resident freeholders within the proposed district have petitioned the County Board of Commissioners of Henderson County, in which all of the proposed district is located, setting forth the boundaries of the proposed sanitary district and the objects it is proposed to accomplish.

That the petition has been approved by the Henderson County Board of Commissioners, which has through its Chairman, J. O. Houston, transmitted the petition to the State Board of Health requesting that the proposed sanitary district be created.

That the Henderson County Board of Commissioners, before passing upon said petition have held a public hearing upon the same and have given prior notice of such hearing by advertisement made by posting of notice at the Henderson County Court House door and also by publication in the Hendersonville *Times-News*, a newspaper published in Henderson County once a week for four successive weeks, and

Whereas, the State Board of Health did name Saturday, August 6th, at the "Guest House" within the proposed "Druid Hills Sanitary District," at which the said State Board of Health did through its representative, H. E. Miller, hold a public hearing concerning the creation of the proposed "Druid Hills Sanitary District," and

Whereas, the State Board of Health did cause at least twenty days' notice to be given of the time and place of such hearing by publishing this information at least five times in the Hendersonville *Times-News*, a newspaper published near the proposed district and having a general circulation therein, and

Whereas, further, upon the report of H. E. Miller, designated to represent the State Board of Health at the hearing, the State Board of Health deems it advisable to comply with the request of said petition and a district for the purposes therein stated should be created and established.

THEREFORE BE IT RESOLVED by the North Carolina State Board of Health that the territory embraced within the following lines and boundaries, viz.:

BEGINNING at a stake in the West margin of Ridgewood Avenue, which stake stands North 3° 45' East 640.5 feet from the intersection of the East margin of Ridgewood Avenue with the North margin of the Mills River Road, being the Northeast corner of lot No. 296 of the Druid Hills Subdivision as shown on plat thereof recorded in Plat Book 2, page 134, of the Records of Plats of Henderson County, and runs thence with the North margin of lot No. 296 North 85° 32' West 83 feet to an iron stake; thence South 4° 200' West 477.3 feet to the Northwest corner of lot No. 285 as shown by plat recorded in Plat Book 2, page 134 of the Records of Plats for Henderson County; thence South 3° 51' West 132.7 feet to a stake in the North margin of the Mills River Road; thence with the North margin of the Mills River Road South 66° 40' East to a point where the North margin of the Mills River Road intersects with the South margin of Ashwood Road, which intersection is as shown by Plat Book 1, page 105, of the Henderson County Records of Plats; thence with the South margin of the Ashwood Road South 84° 39' West to a stake where the South margin of the Ashwood Road intersects the West margin of Druid Hills Avenue; thence South 40° 30' East to the center of Brittain's Creek; thence down and with the center of said creek in a Northeasterly direction and Northerly direction to Saluda Creek, known as Meadow Brook; thence with Meadow Brook in a Westerly direction to the Hendersonville-Asheville Highway; thence in a Northerly direction leaving the New Asheville Highway, following the old Asheville Road to a point where the old Asheville Road turns back into the new Asheville-Hendersonville Highway; thence Northerly with the new Asheville Highway to the point of intersection of said highway with Stoney Mountain Drive; thence North 69° 20' West with Stoney Mountain Drive as shown on page 189, Plat Book 2, of the Records of Plats of Henderson County, to the North corner of lot No. 615 as shown on said plat, it being the North corner of a tract of land con-

veyed by H. H. Carson to the Hendersonville Real Estate Company; thence South 6° 20' West to a creek that flows into Lake Somerset; thence in a South and Southeasterly direction with said creek to the North corner of tract of land conveyed by John Ewbank to the Hendersonville Real Estate Company, it being the North corner of lot No. 478 as shown on plat recorded in Plat Book 2, at page 189, of the Records of Plats of Henderson County; thence with the Ewbank line South 4° 28' West to a stone corner; thence South 65° 0' East 369 feet to a stone corner in the South margin of Briarwood Lane; thence South 2° 56' West to the North margin of an old road, shown as Highgate Road on page 59, Book 2, of the Records of Plats of Henderson County; thence with the North margin of said road South 85° 42' East 134 feet; thence in a North direction to an iron pipe in the South margin of Ferncliff Lane, the Northeast corner of lot No. 553; thence with the South margin of Ferncliff Lane South 87° 28' East 165.5 feet, the Northwest corner of lot No. 552; thence South 4° 18' West 265.3 feet to the North margin of Highgate Road, the Southwest corner of lot No. 557; thence with the North margin of Highgate Road South 85° 42' East 451 feet to the Southeast corner of lot No. 565 as shown on said plat; thence North 4° 18' East to an old corner, the Southwest corner of lot No. 460; thence South 85° 42' East to the east margin of an old road; thence North 4° 18' East to the bed stream of the branch flowing into Lake Somerset; thence with the Druid Hills property line as shown on Plat Book 1, at page 105, of the Records of Plats of Henderson County, a Southeastern direction to a stake standing North 3° 56' East 53.6 feet from the Northwest corner of lot No. 171 as shown on said plat; thence South 3° 56' West to the North margin of Highgate Road, extended; thence crossing the road to a stake at the Northeast corner of lot No. 154 as shown on page 105, Plat Book 1, of the Records of Plats of Henderson County; thence South 3° 16' West 153.6 feet to the old A. Sumney land; thence with the A. Sumney line South 86° 15' East to a stake in the West margin of Ridgewood Avenue; thence with the West margin of Ridgewood Avenue South 3° 45' West to the BEGINNING.

Be and the same is hereby declared to be a sanitary district, under and by virtue of Chapter 100, Public Laws of 1927, with all the rights, powers, and duties conferred and imposed by said chapter.

BE IT RESOLVED, further, that the territory embraced within the foregoing described lines and boundaries shall be designated as the "Druid Hills Sanitary District," and

BE IT RESOLVED, further, that a copy of this resolution be spread upon the minutes of this meeting of the State Board of Health and that the Secretary is directed to forward a certified copy of this resolution to the County Board of Commissioners of Henderson County in which the Druid Hills Sanitary District is located.

The Secretary presented to the Board for its consideration and appropriate action the matter of a proposed sanitary district in Henderson County to be designated "Fletcher Sanitary District," the same to be established in accordance with the provisions of Chapter 100, Public Laws of North Carolina session of 1927. The Secretary presented to the Board the following documents in re said sanitary district:

1. Letter from Mr. J. O. Houston, Chairman Henderson County Board of Commissioners, transmitting petition of citizens of proposed sanitary district.

HENDERSONVILLE, N. C., JULY 14, 1927.

The State Board of Health,
Raleigh, N. C.

Attention Mr. H. E. Miller, Director

Dear Sir and Sirs:

We have received a petition signed by more than fifty-one per cent of the resident freeholders of the territory described therein, asking that the territory described be created into a sanitary district to be known as: "Fletcher Sanitary District." We have approved the petition and have ordered that our Chairman, Mr. J. O. Houston, transmit the petition to the

State Board of Health, with the request that the proposed sanitary district be created. We herewith transmit to you the petition and request that the proposed sanitary district be created.

BOARD OF COUNTY COMMISSIONERS
OF HENDERSON COUNTY.

By J. O. HOUSTON, *Chairman*.

2. Petition to Henderson County Board of Commissioners of citizens of proposed sanitary district:

PETITION FOR FLETCHER SANITARY DISTRICT

We, the undersigned, constituting a majority of the qualified voters in the proposed Sanitary District hereinafter described, do hereby petition Your Honorable Body to establish and create the said territory as a Sanitary District, to be designated and known as the "Fletcher Sanitary District;" the said district to be created for the purpose of providing means to furnish the inhabitants of said district with water and sewerage facilities and water and sewer pipes and systems, and to promote the health and sanitation of said district, pursuant to the authority contained in an Act entitled "An Act to Enable the Creation, Government, Maintenance and Operation of Sanitary Districts and Prescribing the Powers of Such Districts," ratified the 4th day of March, 1927.

The territory to be included in said Sanitary District is described as follows:

BEGINNING at a stake 3.8 feet west of the base of the Robert E. Lee Highway Marker on the Asheville-Hendersonville Highway opposite the Calvary Episcopal Church and running as follows: S. 84° 45' E., 521.8'; S. 69° 48' E., 863.0'; N. 77° 09' E., 896.0'; S. 54° 01' E., 200.0'; S. 55° 13' E., 217.0'; S. 40° 23' E., 350.0'; S. 54° 50' E., 285.0'; S. 41° 46' E., 641.4'; S. 55° 01' E., 681.0'; S. 11° 04' W., 356.7'; S. 16° 04' W., 954.0'; S. 32° 34' W., 113.8'; S. 62° 35' W., 321.3'; S. 58° 35' W., 500.0'; S. 61° 57' W., 552.7'; S. 51° 32' W., 160.5'; S. 41° 32' W., 120.8'; S. 03° 18' W., 184.0'; S. 15° 04' W., 375.0'; S. 20° 04' W., 400.0'; S. 10° 04' W., 550.0'; S. 32° 36' W., 2497.5'; N. 74° 58' W., 98.0'; S. 67° 00' W., 123.1'; S. 89° 06' W., 280.0'; N. 00° 54' W., 1660.0'; N. 09° 54' W., 808.0'; N. 07° 23' W., 557.0'; N. 09° 52' W., 158.0'; N. 46° 21' W., 273.0'; N. 12° 31' W., 280.0'; N. 41° 21' W., 206.0'; N. 40° 51' W., 275.0'; N. 12° 11' W., 900.0'; N. 40° 34' E., 598.1'; N. 35° 04' E., 199.5'; N. 27° 27' E., 929.8'; N. 22° 33' E., 207.0'; N. 17° 44' E., 271.7'; N. 26° 57' W., 834.3'; N. 62° 29' E., 46.7' to the BEGINNING.

T. W. SUMNER
J. P. FLETCHER
L. P. RUSSELL
T. J. SINGLETON
MRS. T. J. SINGLETON
MAMIE SOUTHER
H. SOUTHER
L. T. ELLENBURG
MRS. EDITH ELLENBURG
R. B. MAXWELL
EUNICE MAXWELL
F. S. SOUTHER
C. M. COGILL
MRS. C. M. COGILL
S. C. WHITAKER
ELLA WHITAKER
C. F. DOCKINGS
MRS. C. F. DOCKINGS
H. C. SOUTHER
W. C. BAGWELL
J. R. CULBERSON
GEORGE CULBERSON
J. G. WALKER
JOHN LAUGHTER

EVELYN WALKER
M. T. PRESSLEY
HOMER LANCE
ELEANOR LANCE
B. F. LAUGHTER
ANGELINE PRESSLEY
FANNIE LAUGHTER
G. W. LANCE
C. S. BAGWELL
C. H. LANCE
C. R. SORRELL
R. B. BLAKE
J. N. YOUNGBLOOD
MRS. J. N. YOUNGBLOOD
J. O. RHODES
HATTIE RHODES
O. M. RUTLEDGE, JR.
ELIZABETH SOUTHER
G. C. SALES
W. P. LANCE
MRS. BESSIE P. LANCE
W. R. ROBERTSON
H. C. WATSON
M. F. SIGMON

GRACE SUMNER	P. A. SIGMON
W. L. DUNLOP	D. E. COTTON
MRS. E. J. PRESLEY	MAY C. LANCE
LUCILE SALES	MATTIE F. FLETCHER
E. J. BALLARD	S. E. McMIM
M. L. BALLARD	MARY FRESLEY
W. E. JOHNSTON	MRS. MABLE DUNLOP
CLOE JOHNSTON	MRS. J. C. SALES
TOM MOORE	MRS. J. T. SALES
LULA MOORE	J. C. SALES
LOLA BARNWELL	J. F. HARRIS
K. B. BARNWELL	C. P. McMIM
R. P. WATSON	S. L. McMIM
MRS. W. R. ROBERTSON	F. C. LESTER
CHARLES F. PLAIN	MRS. CORA LESTER
ED. FRESLEY	JERRY MURPHY
ELSIE FRESLEY	MURTLIE MURPHY
B. A. QUAILS	ARTHUR WARD
H. B. WOLFE	LORA WARD
MAY WOLFE	A. M. PRESLEY
MRS. ED CROOK	MRS. A. M. PRESLEY
W. E. POTEAT	MRS. H. E. MAXWELL
MRS. E. A. SOUTHER	SAM McMEIN
MRS. MINNIE MOSS	GERTRUDE McMEIN
NELSON SUTTLE	E. C. BRACHETT
LELA SUTTLE	MRS. PEARL QUALES
ED ISREAL	RUSSEL YOUNGBLOOD
MRS. G. C. SALES	E. J. PRESLEY
MRS. C. R. SORRELL	MRS. LENNIE COTTON

3. Supporting affidavit of T. W. Sumner.

STATE OF NORTH CAROLINA,
HENDERSON COUNTY.

OFFICE BOARD COUNTY COMMISSIONERS
IN THE MATTER OF SANITARY DISTRICT FOR VILLAGE OF
FLETCHER, HENDERSON COUNTY, N. C.

T. W. Sumner, being duly sworn, says that he is a citizen and resident of the Village of Fletcher, and was one of the petitioners who signed the petition for establishment of Sanitary District at Fletcher, N. C., and being a resident of said village and acquainted with the territory embraced within the petition for Sanitary District, knows all of the freeholders and voters therein; that he has examined the petition on file with the Board of Commissioners for Henderson County, and that from his knowledge and acquaintance aforesaid, finds that more than 51% and more than 75% of the freeholders and voters within said boundary have signed said petition, and that said petition, in good faith, states the wishes of said petitioners residing within the territory described in their said petition.

T. W. SUMNER.

Sworn to and subscribed before me this 15th day of July, 1927.

SEAL

J. P. FLETCHER,
Notary Public,
Henderson County,
Fletcher, N. C.

My commission expires July 15, 1929.

4. Certified copy minutes Henderson County Board of Commissioners under date of May 3, 1927.

STATE OF NORTH CAROLINA,
HENDERSON COUNTY.

OFFICE BOARD OF COUNTY COMMISSIONERS

IN RE: ESTABLISHMENT OF FLETCHER SANITARY DISTRICT,
HENDERSON COUNTY, N. C., PURSUANT TO ACT OF GENERAL ASSEMBLY, PUBLIC LAWS 1927, CHAPTER 100.

NOTICE

Petition having been filed before the Board of Commissioners for Henderson County by T. W. Sumner, J. P. Fletcher and others, asking for the establishment at Fletcher, Henderson County, N. C., of a sanitary district to be designated and known as Fletcher Sanitary District, notice to is hereby given, pursuant to Chapter 100, Public Laws 1927, that the Board of Commissioners for Henderson County will give a public hearing upon said petition at the office of the Board of Commissioners for Henderson County, at Hendersonville in said county on June 4, 1927, at 10 o'clock A.M., when and where all persons interested in any way in the establishment of the above mentioned Sanitary District are requested to be present and to freely express themselves upon the subject of the establishment of said Sanitary District.

It is further ordered that the publication of this order shall constitute said notice of the above meeting. Same to be published at the Court House door from and after this date and in the Hendersonville *Times-News*, once a week for four successive weeks hereafter before said hearing.

The action of the Board of Commissioners upon said petition and upon the establishment of said Sanitary District will be given full consideration at said meeting, and the question of its establishment will be determined.

This May 3, 1927.

J. O. HOUSTON, *Chairman*,
Board of County Commissioners.

Attest:

W. T. Drake, Clerk to
Board of County Commissioners.

I, W. T. Drake, Register of Deeds for the County of Henderson, State of North Carolina, do hereby certify that the foregoing copies are true and correct, as appears in Minute Book No. 10, on page 294 and 300 A.

This July 16, 1927.

SEAL

W. T. DRAKE,
Register of Deeds.

5. Certified copy of resolution from minutes of Henderson County Board of Commissioners approving proposed Sanitary District under date of June 4, 1927.

STATE OF NORTH CAROLINA,
HENDERSON COUNTY.

OFFICE BOARD COUNTY COMMISSIONERS

IN THE MATTER OF ESTABLISHMENT OF SANITARY DISTRICT
IN VILLAGE OF FLETCHER, HENDERSON COUNTY, N. C.

The Board of Commissioners for Henderson County having read the notice of filing of said petition, read the petition and read the affidavit of T. W. Sumner that said petition contains more than 51% of the freeholders and voters in the boundary given, find that notice of filing of said petition was properly given by publication in the *Times-News*, a newspaper published in Hendersonville, County and State aforesaid; that from the acquaintance of members of said Board with the people of said village, and from the affidavit of T. W. Sumner, find that more than 51% of the freeholders and voters in said district have signed the petition presented to this Board, and that after giving said notice and filing said petition, a public meeting, as required by statute, was held by the Board of Commissioners on the 4th day of June, 1927, at which meeting, certain citizens

and petitioners were present advocating adoption of their petition, and notwithstanding that due notice was given, there was no opposition to same.

NOW, THEREFORE, upon full consideration by the Board of Commissioners for Henderson County, it is resolved and ordered that the establishment of said boundary described in said petition be recommended to the State Board of Health for the establishment of a Sanitary District therein.

FURTHER, that this order be entered upon the Minutes of this Board, and that a copy of same with the notice of meeting, the filing of the petition, be certified by the Clerk to this Board and forwarded to the State Board of Health, Raleigh, N. C., for such action as said Board may see proper to take thereon.

This 4th day of June, 1927.

J. O. HOUSTON, *Chairman,*
Board Comm. Henderson Co.,
J. A. BROCK,
County Commissioner,
C. O. ENGLISH
County Commissioner.

I, W. T. Drake, Register of Deeds for Henderson County and Ex Officio Clerk to Board of Commissioners for Henderson County, do hereby certify that the foregoing is the true order of the Board of Commissioners made and entered in above entitled matter, as same appears recorded upon the Minutes of said Board of Commissioners for the date of June 4, 1927.

This July 16, 1927.

W. T. DRAKE,
Register of Deeds for Henderson County, and ex Officio Clerk to Board of Commissioners for Henderson Co.

SEAL

Recorded in Book No. 10, page 300A, Minutes of County Commissioners for Henderson County, North Carolina.

6. Official designation of H. E. Miller as agent of the State Board of Health to hold public hearing on August 8, 1927.

RALEIGH, N. C., JULY 16, 1927.

MR. H. E. MILLER, *Director,*
Bureau of Sanitary Engineering,
State Board of Health,
City.

DEAR MR. MILLER:

In reply to yours of even date with reference to the submission of Fletcher Sanitary District petition and the public hearing which is required to be held by a representative of the State Board of Health under the provisions of Chapter 100, Public Laws of 1927, you are hereby directed to take the necessary steps as required by Section 4, Chapter 100, Public Laws of 1927, for the publication of notice of public hearing tried within the Fletcher Sanitary District on Monday, August 8th and you are further directed to appear at this hearing for and as the agent of the State Board of Health to take note of such reasons as may be advanced for or against the formation of the Sanitary District as provided for in the petition aforementioned and to report such findings to the State Board of Health at such time as may be further directed.

Very truly yours,
(Signed) CHAS. O'H. LAUGHINGHOUSE,
State Health Officer.

7. Copy of notice of hearing before Henderson County Board of Commissioners published in the Hendersonville *Times-News*:

NOTICE

STATE OF NORTH CAROLINA,
HENDERSON COUNTY.

OFFICE BOARD COUNTY COMMISSIONERS

In re: Establishment of Fletcher Sanitary District, Henderson County, North Carolina, Pursuant to Act of General Assembly, Chapter 100, Public Laws of 1927.

Petition having been filed before the Board of Commissioners for Henderson County by T. W. Sumner, J. P. Fletcher and others, asking for the establishment at Fletcher, Henderson County, N. C., of a Sanitary District to be designated and known as "Fletcher Sanitary District," notice is hereby given pursuant to Chapter 100, Public Laws 1927, that the Board of Commissioners for Henderson County will give a public hearing upon said petition at the office of the Board of Commissioners for Henderson County, at Hendersonville in said County on June 4, 1927, at 10 o'clock A.M., when and where all persons interested in any way in the establishment of the above mentioned Sanitary District are requested to be present and to freely express themselves upon the subject of the establishment of said Sanitary District.

It is further ordered that the publication of this order shall constitute said notice of the above meeting, same to be published at the Court House door from and after this date, and in the Hendersonville *Times-News*, once a week for four successive weeks hereafter before said hearing.

The action of the Board of Commissioners upon said petition and upon the establishment of said Sanitary District will be given full consideration at said meeting, and the question of its establishment will be determined.

This May 3, 1927.

J. O. HOUSTON, *Chairman*,
Board of County Comm.

Attest: W. T. Drake,
Clerk to Board of County Comm.

8. Affidavit of publication of hearing before commissioners.

STATE OF NORTH CAROLINA,
COUNTY OF HENDERSON.

AFFIDAVIT OF PUBLICATION

Personally appeared before me J. T. Fain, manager of the Hendersonville *Times-News*, a newspaper published in the City of Hendersonville, County and State aforesaid, who being duly sworn states that the NOTICE of the establishment of the Fletcher Sanitary District in the case of _____ copy of which is attached, was inserted in the *Times-News* in its issues of May 4, 1927, and once a week thereafter until a total of four insertions had been given.

J. T. FAIN, (Seal)
Manager.

Sworn and subscribed to before me this 16th day of July, 1927.

S. M. KING, C. S. C. (Seal)

9. Copy of notice of public hearing published in the Hendersonville *Times-News*.

NOTICE

In re: Establishment of Fletcher Sanitary District, Henderson County, North Carolina, Pursuant to Act of General Assembly, Chapter 100, Public Laws of 1927.

Petition having been filed before the State Board of Health by T. W. Sumner, J. P. Fletcher and others asking for the establishment at Fletcher, Henderson County, North Carolina, of a Sanitary District to be designated and known as "Fletcher Sanitary District," notice is hereby given, pursuant to Chapter 100, Public Laws 1927, that the State Board of Health

will give a public hearing upon said petition at the Fletcher graded school at Fletcher, N. C., in said county on August 8, 1927, at 8 o'clock P.M., when and where all persons interested in any way in the establishment of the above mentioned Sanitary District are requested to be present and to freely express themselves upon the subject of the establishment of said Sanitary District.

By order of the State Board of Health of the State of North Carolina. This 19th day of July, 1927.

CHAS. O'H. LAUGHINGHOUSE,
Sec'y-Treas. and State Health Officer.

10. Affidavit of publication of notice of public hearing.

STATE OF NORTH CAROLINA,
COUNTY OF HENDERSON.

AFFIDAVIT OF PUBLICATION

Personally appeared before me J. T. Fain, manager of the Hendersonville *Times-News*, a newspaper published in the City of Hendersonville, County and State aforesaid, who being duly sworn states that the NOTICE in re: establishing Fletcher Sanitary District at Fletcher, N. C., in the case of _____ copy of which is attached, was inserted in the *Times-News* in its issues of July 19, 1927, and four times thereafter, a total of five insertions of said notice.

J. T. FAIN, (Seal)
Manager.

Sworn and subscribed to before me this 20th day of August, 1927.
SEAL C. M. RHODES.

My commission expires September 7, 1928.

11. Report of H. E. Miller, agent of the State Board of Health of public hearing held August 8, 1927.

GENTLEMEN:

Pursuant to the directions of Dr. Chas. O'H. Laughinghouse, Secretary of the North Carolina State Board of Health by letter under date of July 16th, I beg to respectfully submit the following report:

Under date of July 14, 1927, the Henderson County Board of Commissioners through its Chairman, Mr. J. O. Houston, transmitted to the State Board of Health together with supporting documents a petition known as the "Fletcher Sanitary District" petition signed by T. W. Sumner and others which was submitted to the Henderson County Board of Commissioners in accordance with the provisions of Section 3, Chapter 100, Public Laws of 1927, requesting that a certain area to be known as the "Fletcher Sanitary District" therein described in detail, and located wholly within Henderson County be created and established as a Sanitary District under the provisions of Chapter 100, Public Laws of 1927, "An Act to Enable the Creation, Government, Maintenance, and Operation of Sanitary Districts and Prescribing the Powers of such District." This communication states that the Henderson County Board of Commissioners have approved the petition and transmit the same to the State Board of Health with the request that the proposed sanitary district be created.

The supporting documents include:

1. Affidavit by T. W. Sumner, setting forth that the names of persons signed to the petition are signatures of resident freeholders within the proposed sanitary district and that those signing constitute more than 51% of all the resident freeholders within the proposed sanitary district.

2. Copy of minutes of County Commissioners' meeting of Henderson County of May 3, 1927, setting forth that a petition has been received requesting the formation of "Fletcher Sanitary District," that it was ordered that a public hearing of this petition be held at ten o'clock A.M., June 4, 1927, and that notices of the public hearing on said day be published and posted on the Court House door as provided in Chapter 100, Public Laws of 1927.

3. Affidavit by J. T. Fain, General Manager of the Hendersonville *Times-News*, to the effect that notice of hearing of "Fletcher Sanitary District" petition by the Henderson County Board of Commissioners was inserted in the *Times-News* in its issue of May 4, 1927, and once a week thereafter until a total of four insertions had been given.

4. A copy of minutes and resolution adopted by the Henderson County Board of Commissioners on June 4, 1927, setting forth that the commissioners found as a fact that more than 51% of the freeholders of the proposed Fletcher Sanitary District signed the petition submitted to the Henderson County Board of Commissioners and at the public hearing on the 4th day of June, freeholders of the proposed district were present in support of the formation of a sanitary district and that no opposition to the formation of a sanitary district was voiced; that the Henderson County Board of Commissioners recommended to the State Board of Health the creation of the proposed Fletcher Sanitary District.

Upon receipt of these documents as set forth above, Dr. Chas. O'H. Laughinghouse, Secretary of the State Board of Health was advised of their receipt by my letter of July 16th and by a letter of even date directed me to proceed with measures for giving suitable notice of public hearing as provided for in Section 4, Chapter 100, Public Laws of 1927, and to attend such hearing as an agent of the State Board of Health and to report the results and findings of such hearing to the State Board of Health.

Due notice of publication of public hearing by a representative of the State Board of Health upon the petition for the formation of the proposed "Fletcher Sanitary District" was made in the Hendersonville *Times-News* as set forth in an affidavit attached hereto made by Mr. J. T. Fain, General Manager of the Hendersonville *Times-News*, said affidavit being made under date of July 16, 1927.

In accordance with the notice of public hearing of the proposed "Fletcher Sanitary District," petition published as set forth in the affidavit of J. T. Fain under date of August 20, 1927, a public hearing was held at the Graded School House at Fletcher in the proposed sanitary district in Henderson County on Monday, August 8th, at eight P.M. The writer was present as an agent of the State Board of Health in accordance with the direction of Dr. Laughinghouse under date of July 16th.

On behalf of the citizens of the proposed "Fletcher Sanitary District," T. W. Sumner, J. P. Fletcher and other freeholders of the proposed "Fletcher Sanitary District" advanced the need of the formation of a sanitary district and urgently requested that the State Board of Health give prompt and favorable action to the petition submitted.

Inasmuch as there was no opposition voiced by any one to the proposition of the formation of the proposed "Fletcher Sanitary District," and inasmuch as there is serious and pressing need for the water supply and sewerage improvements contemplated if the proposed district is formed, and further, since the area embraced in the boundaries as described in the petition for the proposed "Fletcher Sanitary District" is suitably situated for the installation of community water supply and sewerage service, it is respectfully recommended that this petition receive favorable action by the North Carolina State Board of Health.

Very truly yours,

(Signed) H. E. MILLER, *Director*,
Bureau of Sanitary Engineering.

August 23, 1927.

All of the above documents in re: proposed "Fletcher Sanitary District" being before the Board and duly considered, upon motion of Dr. A. J. Crowell, seconded by Dr. D. A. Stanton, the following resolution was unanimously adopted:

Whereas, a petition for the formation of the proposed "Fletcher Sanitary District" submitted to the County Board of Commissioners of Henderson County was transmitted to the North Carolina State Board of Health with the approval and recommendations of the said Henderson County Board of Commissioners, and

Whereas, the said petition was received at the office of the North Carolina State Board of Health at a time the State Board of Health was not in session, and

Whereas, further, Dr. Charles O'H. Laughinghouse, the Secretary of the North Carolina State Board of Health did, acting for the State Board of Health under date of July 16th, issue directions to H. E. Miller, Director of the Bureau of Sanitary Engineering of the said Board of Health to proceed under the provisions of Chapter 100, Public Laws of 1927, with such steps as required under Section 4 of said Chapter 100, for the publication of notice of public hearing on the said "Fletcher Sanitary District" petition as provided for in Section 4 of said Chapter 100, and

Whereas, Dr. Charles O'H. Laughinghouse did acting for the State Board of Health under the same date direct H. E. Miller to appear at said hearing for and as the agent of the said Board of Health, and

Whereas, further, Dr. Charles O'H. Laughinghouse, Secretary of said Board of Health did through the said H. E. Miller cause to have published in the Hendersonville *Times-News* in accordance with the provisions of Section 4, Chapter 100, public notice of public hearing upon the said "Fletcher Sanitary District" petition to be held in Fletcher, Henderson County, on Monday, August 8th, now

THEREFORE BE IT RESOLVED, that the North Carolina State Board of Health this day in session, does authorize and approve the foregoing as an act of the North Carolina State Board of Health,

RESOLVED, further, that this resolution be spread upon the minutes of the North Carolina State Board of Health as a part of the official record of transactions of the North Carolina State Board of Health with reference to the proposed "Fletcher Sanitary District."

Thereupon the following resolution formally creating the "Fletcher Sanitary District" under and by virtue of Chapter 100, Public Laws of North Carolina, Session of 1927, was presented by the Secretary, and upon motion of Dr. J. B. Wright, seconded by Dr. E. J. Tucker, the same was unanimously adopted:

The North Carolina State Board of Health assembled in special session at Raleigh, this the 23rd (twenty-third) day of August, 1927, has reviewed the petition for the formation of a Sanitary District to be known as the "Fletcher Sanitary District," the same being located in Henderson County, North Carolina, and bounded as hereinafter set forth.

Whereas, upon review of the said petition with affidavits of T. W. Sumner and W. T. Fain, and certified copies of extracts from the minutes of meetings of the Henderson County Board of Commissioners, it appears that more than fifty-one per cent of the resident freeholders within the proposed district have petitioned the County Board of Commissioners of Henderson County, in which all of the proposed district is located, setting forth the boundaries of the proposed sanitary district and the objects it is proposed to accomplish,

That the petition has been approved by the Henderson County Board of Commissioners, which has through its Chairman, J. O. Houston, transmitted the petition to the State Board of Health requesting that the proposed sanitary district be created.

That the Henderson County Board of Commissioners, before passing upon said petition have held a public hearing upon the same and have given prior notice of such hearing by advertisement made by posting of notice at the Henderson County Court House door and also by publication in the Hendersonville *Times-News*, a newspaper published in Henderson County once a week for four successive weeks, and

Whereas, The State Board of Health did name Monday, August 8th, at the Graded School House at Fletcher, at which the said State Board of Health did through its representative, H. E. Miller, hold a public hearing concerning the creation of the proposed "Fletcher Sanitary District," and

Whereas, The State Board of Health did cause at least twenty days' notice to be given of the time and place of such hearing by publishing this information at least five times in the Hendersonville *Times-News*, a newspaper published near the proposed district and having a general circulation therein, and

Whereas, further, upon the report of H. E. Miller, designated to represent the State Board of Health at the hearing, the State Board of Health deems it advisable to comply with the request of said petition and a district for the purposes therein stated should be created and established,

THEREFORE BE IT RESOLVED, by the North Carolina State Board of Health that the territory embraced within the following lines and boundaries, viz.:

BEGINNING at a stake 3.8 feet West of the base of the Robert E. Lee Highway Marker on the Asheville-Hendersonville Highway opposite the Calvary Episcopal Church and running as follows:

S. 84° 45' E., 521.8'; S. 69° 48' E., 863.0'; N. 77° 09' E., 896.0'; S. 54° 01' E., 200.0'; S. 55° 13' E., 217.0'; S. 40° 23' E., 350.0'; S. 54° 50' E., 285.0'; S. 41° 46' E., 641.4'; S. 55° 01' E., 681.0'; S. 11° 04' W., 356.7'; S. 16° 04' W., 954.0'; S. 32° 34' W., 113.8'; S. 62° 35' W., 321.3'; S. 58° 35' W., 500.0'; S. 61° 57' W., 552.7'; S. 51° 32' W., 160.5'; S. 41° 32' W., 120.8'; S. 03° 18' W., 184.0'; S. 15° 04' W., 375.0'; S. 20° 04' W., 400.0'; S. 10° 04' W., 550.0'; S. 32° 36' W., 2497.5'; N. 74° 58' W., 98.0'; S. 67° 00' W., 123.1'; S. 89° 06' W., 280.0'; N. 00° 54' W., 1660.0'; N. 09° 54' W., 808.0'; N. 07° 23' W., 557.0'; N. 09° 52' W., 158.0'; N. 46° 21' W., 273.0'; N. 12° 31' W., 280.0'; N. 41° 21' W., 206.0'; N. 40° 51' W., 275.0'; N. 12° 11' W., 900.0'; N. 40° 34' E., 598.1'; N. 35° 04' E., 199.5'; N. 27° 27' E., 929.8'; N. 22° 33' E., 207.0'; N. 17° 44' E., 271.7'; N. 26° 57' W., 834.3'; N. 62° 29' E., 46.7' to the BEGINNING;

be and the same is hereby declared to be a sanitary district, under and by virtue of Chapter 100, Public Laws of 1927, with all the rights, powers and duties conferred and imposed by said chapter.

BE IT RESOLVED, further, that the territory embraced within the foregoing described lines and boundaries shall be designated as the "Fletcher Sanitary District," and

BE IT RESOLVED, further, that a copy of this resolution be spread upon the minutes of this meeting of the State Board of Health and that the Secretary is directed to forward a certified copy of this resolution to the County Board of Commissioners of Henderson County in which the Fletcher Sanitary District is located.

Mr. H. E. Miller, sanitary engineer of the Board, explained that in accordance with the amendment to the sanitary privy law passed by the 1927 General Assembly, certain changes have become necessary in the rules and regulations adopted by the Board for the construction and maintenance of earth pit privies. Upon motion of Doctor Crowell, seconded by Doctor Tucker, the following resolution was unanimously adopted:

Whereas, the General Assembly of North Carolina did enact Chapter 244, Public Laws of 1927, "AN ACT TO AMEND CHAPTER 118, Article 8, Section 7130, Consolidated Statutes Relating to Sanitary Privies," the same being in force from and after its ratification, March 9, 1927, and

Whereas, in order to conform to the full letter and spirit of this statute, the Secretary, on behalf of the State Board of Health, authorized the amendment of Special Bulletin No. 182—Reprint "PLANS AND SPECIFICATIONS FOR APPROVED EARTH PIT PRIVIES" as follows:

"Your letter of March 11th enclosing proposed changes in the method and plan of putting the Sanitary Privy Law into execution since its amendment, to hand.

"I am requesting suitable stickers or stamps including the amendment, Section 2, same to be pasted on the cover page of Special Bulletin No. 182. You are authorized to have said sticker printed, as well as a second sticker as a substitute for Section (d), the same to read as follows:

"The building should, and all items pertaining to the exclusion of flies from excreta, shall conform to plans and specifications hereinafter set forth.' This is to be pasted over Section (d). This plan will use the Bulletins that we now have in stock and the Board, at its next meeting, will consider the regulations for construction of privies changing same to conform to the amended statute."

NOW, THEREFORE BE IT RESOLVED, that the North Carolina State Board of Health does hereby approve and endorse said amendments as directed by the Secretary and order the reprinting of the said Special Bulletin No. 182—Reprint, as the amended regulation adopted by the State Board of Health, by authority of and in conformity with the provisions of Chapter 71, Public Laws of 1919 as amended, and

RESOLVED FURTHER that this resolution be spread upon the minutes of this meeting of the North Carolina State Board of Health.

PLANS AND SPECIFICATIONS FOR APPROVED EARTH PIT PRIVIES

In Accordance With Consolidated Statutes of North Carolina, Chapter 118, Article 8, Sections 7129-7144 as Amended by Chapter 244, Public Laws of 1927.

AN ACT TO PREVENT THE SPREAD OF DISEASE FROM INSANITARY PRIVIES

SECTION 7129. The term "privy" as used in this article shall be understood to include any and all buildings which are not connected with a system of sewerage, or with septic tanks of such construction and maintenance as approved by the State Board of Health and which are used for affording privacy in acts of urination or defecation.

SEC. 7130. No person shall maintain or use a residence, located within three hundred yards of another residence, that is not provided with sewerage, or with septic tanks approved by the State Board of Health, or with a sanitary privy which complies in construction and maintenance with the requirements of this article.

(Amended by Chapter 244, Public Laws 1927): "Provided, that plans and specifications for construction of privy buildings prescribed by the State Board of Health by authority of this article shall be construed as recommendatory, but not mandatory as to exact size, architecture and dimensions of same: *Provided, further*, that privy buildings as used in this act shall not be construed to include any item pertaining to the exclusion of flies from excreta."

SEC. 7132. Every privy located within three hundred yards of the residence of any person other than that of the owner or tenant thereof shall be maintained in a sanitary manner and in accordance with reasonable rules and regulations to be prescribed by the State Board of Health and posted in suitable form inside of the privy by an officer of the said Board.

Specifications

THE EARTH PIT PRIVY—CLASS 1

1. LOCATION

(a) The earth pit privy shall be located at least 100 feet from any well, spring, or other source of domestic water supply, and upon ground sloping therefrom.

(b) The earth pit privy shall never be located upon swampy ground. Exceptions to this rule may be permitted at the discretion of the State Board of Health.

(c) The earth pit privy shall never be located where formations of solid or fissured rock lie closer than 10 feet below the ground surface. Distances less than 10 feet may be maintained only with the approval of the State Board of Health.

(d) The building should, and all items pertaining to the exclusion of flies from excreta shall conform to plans and specifications.

(1) The pit shall be provided with a box curbing, fitted closely to the sides of the pit.

(2) In loose sandy soils the pit shall be curbed or sheeted from top to bottom.

(a) Boards shall be placed over the ground surface on the rear side of the building to prevent caving caused by rain water running off from roof.

There being no further business, upon motion of Doctor Stanton, the Board adjourned.

CHAS. O'H. LAUGHINGHOUSE,
Secretary.

BOARD MEETING

RALEIGH, N. C., JANUARY 23, 1928.

Pursuant to call by the President Pro Tem, the State Board of Health met in the offices of the Board in Raleigh at 11 o'clock, Monday, January 23, 1928, with the following members present: Dr. Cyrus Thompson, Dr. A. J. Crowell, Dr. Thos. E. Anderson, Dr. D. A. Stanton, Dr. John B. Wright, Dr. E. J. Tucker, Dr. Chas. C. Orr and Mr. James P. Stowe.

The following telegram from Dr. L. E. McDaniel was presented: "Due to sickness impossible to be there this morning. Am sorry."

Minutes of called meeting on August 23, 1927, were read and upon motion of Dr. Stanton, seconded by Dr. Tucker, were approved.

The Secretary presented the following brief summary of the work for the year 1927, which upon motion by Dr. Crowell, seconded by Dr. Tucker, was ordered spread upon the minutes.

While complete statistics are not yet available, there is sufficient information in hand to state definitely that the past year of 1927 was on the whole most satisfactory from the public health viewpoint. There have been some losses and some gains, but the gains have exceeded the losses, so that a final audit of health conditions will show distinct improvement.

The compilation of birth and death certificates for the year can not be completed for several months. Returns for the month of December are now far from complete, and experience teaches that there will be delayed certificates received for other months. A careful estimate for the year indicates that there were approximately 82,774 births and 32,938 deaths reported during the year. This, based on an estimated state population of 2,908,000, gives for the year a birth rate of 28.4 and a death rate of 11.3 per thousand of population. This would indicate the lowest death rate for the State since accurate data have been available. There is a decline from 1926 of .7 per thousand of population, a decrease that is highly gratifying.

Preliminary figures indicate satisfactory declines in tuberculosis, typhoid fever and diphtheria, three of the causes of death against which intensive efforts have been made by the Board and the profession for a number of years. Figures for tuberculosis are not now available, but the reports of deaths month by month have shown less deaths reported. For typhoid fever there were 1,208 cases reported for the year as against 1,502 cases in 1926, a reduction in cases reported of 222. Diphtheria also showed some decrease, from 3,198 cases reported in 1926 to 3,034 cases in 1927, a decrease of 164. Corresponding decreases in the number of deaths may be expected, setting a record in low death rates from these two causes.

At present the State is experiencing a periodic State-wide occurrence of measles and whooping cough, a condition that can be counted upon regularly every four to five years. Warning through *The Bulletin* and through

the newspapers of the State have been given of the danger of both of these communicable diseases particularly to very young children.

The occurrence of communicable diseases in the State as reported for the year were:

Whooping cough	19,966
Measles	32,882
Diphtheria	3,034
Scarlet fever	2,638
Septic sore throat	177
Smallpox	1,702
Chickenpox	4,818
Typhoid fever	1,280
Cerebrospinal meningitis	24
Ophthalmia neonatorum	6
Trachoma	2
Syphilis	3,226
Gonorrhea	2,011
Chancroid	151

During the year there has been no change in the executive staff of the Board but by means of shifting personnel we have been able to restore the division of epidemiology. Dr. H. A. Taylor was made director of this division effective July 1st, and Dr. George Collins was made director of the Bureau of Maternity and Infancy, following three years of service as assistant director. Through the courtesy of the International Health Board, Dr. Taylor was enabled during November and December to visit a number of other states for observation and study, and through the same source a scholarship in the School of Public Health at Johns Hopkins was granted to him for the second semester. Dr. Taylor is now on leave of absence until April 1st. To assist in financing this division of work, the International Health Board is granting the Board \$3,543.75 for the year 1928.

Briefly summarizing the work of the Board during the past year, I desire to call your attention especially to the work of the Laboratory of Hygiene. No service performed by the Board is more appreciated. The following summary shows the laboratory's work for the year:

Diphtheria Antitoxin Units	92,288,000
Pasteur Treatments Supplied	1,658
Wassermann Tests Made	45,462
Total Examinations made by the Laboratory	64,455
Doses Ty. Vaccine Distributed	811,613
Doses of Toxin-Antitoxin Distributed	320,745
Doses of Smallpox Vaccine Distributed	337,620
No. of Water Analyses Made	5,389
No. of Schick Tests	36,765
No. of Schick Control Tests	18,374
No. of Ampules of Neo-arsphenamine Distributed	26,404
Tetanus Antitoxin Distributed (Units)	14,088,715
Pertussis Vaccine Distributed	91,913
Syringes Scarlet Fever Antitoxin Distributed	272
No. of Dick Tests	2,030

During the year the Board has given financial assistance towards the maintenance of 38 county health departments. Two additional county departments were organized during the year, Randolph and Transylvania. After six months Transylvania discontinued its health department because of lack of money. This gave a net gain of one new county department

developed during the year. The counties to which the Board is contributing for this purpose are: Beaufort, Bertie, Bladen, Brunswick, Buncombe, Cabarrus, Carteret, Columbus, Craven, Cumberland, Davidson, Durham, Edgecombe, Forsyth, Granville, Halifax, Henderson, Johnston, Lenoir, Mecklenburg, Nash, New Hanover, Northampton, Pamlico, Pitt, Randolph, Richmond, Robeson, Rowan, Rutherford, Sampson, Surry, Vance, Wake, Wayne, Wilkes and Wilson. In addition, Guilford County maintains a county health department and Greensboro, High Point, Winston-Salem, Asheville and Rocky Mount have city departments to which the Board does not contribute. About sixty per cent of the State's population now has the advantage of public health service.

In addition to assisting in the maintenance of these 38 general county health departments, the Board by means of a combination of State and Federal funds is rendering further financial assistance in 19 counties for the purpose of promoting the welfare of maternity and infancy. These counties are: Robeson, Pitt, Forsyth, Lenoir, Halifax, Nash, Richmond, Sampson, Wayne, Brunswick, Edgecombe, Rowan, Durham, New Hanover, Wake, Beaufort, Mecklenburg, Jackson and Warren. The financial assistance is for the specific purpose of employing a nurse limiting her service to maternity and infancy work. This division also supervises the 6,000 midwives of the State, distributes silver nitrate solution to physicians and midwives for use in the eyes of the new-born as required by law, and conducts a correspondence course for expectant mothers with an average enrollment of about 8,000.

In the division of Medical Inspection of Schools a director of oral hygiene, eight dentists and eight nurses are employed. During the past school year 259,862 children were inspected by these nurses with the following defects discovered: hearing 571, vision 8,049, throat 29,852, teeth 27,110, other defects 5,626. During the summer months tonsil and adenoid clinics were held in the following counties: Hertford, Hyde, Pamlico, Pender, Bladen, Duplin, Columbus, Caswell, Swain, Haywood, Clay, Jackson, Graham, Orange, Warren, Person and Harnett and 1,863 operations were performed by specialists who were selected by the local boards of health. About 60,000 children were examined by the school dentists and 29,796 were given needed dental treatment.

In the health education division the monthly publication of the Board, *The Health Bulletin*, has continued to maintain its high standard as the best publication of its class in the United States. There are 20,000 copies distributed monthly. Other literature, special educational pamphlets and placards, have been distributed in number exceeding 1,000,000 pieces. The motion picture unit has been used in ten counties and has exhibited to more than 60,000 people.

An important undertaking of the Board has been completed during the year. This was the malaria survey of the impounded waters projects, High Rock development of the Tallassee Power Company, Norwood development of the Carolina Power & Light Company, and the Lake Lure development of the Chimney Rock Company. A chemist-biologist and two nurses have been engaged in this work. The final report of these surveys will not be complete for some weeks, but I am confident they will prove most valuable in connection with this phase of the industrial development of the State.

The work of the engineering division has been rapidly expanding to meet increasing demands for service. Routine work has included the inspection of hotels and cafes, the enforcement of the sanitary privy law, the supervision of jails and convict camps, the development of milk sanitation, and the supervision of public water supplies. During the year three new water works systems have been installed, bringing the total in the State to 245, serving about one-third of the State's population. Extensive improvements or new plants have been installed for thirteen cities, and six filter plants have been installed. Twenty-four major projects of sewage disposal have either been completed or were under way during the year. Equally satisfactory has been the increase in sanitary control of milk supply. Elizabeth City, Reidsville, Whiteville and Asheboro have adopted the standard milk ordinance during the year, bringing the total of cities having protected milk supplies to 43.

Three new phases of engineering work have developed during the year: engineering service for State institutions, school sewage disposal, and stream pollution studies. Six institutional sewage disposal plants were designed and installation supervised at material saving to the State, and advisory service rendered in numerous other instances. Demands for this type of service are increasing steadily. In school sewage disposal, the rapid increase in the number of consolidated schools has developed this phase of service to a major position in the program of work. A total of 174 plants were designed and generally supervised during the year, totaling in cost \$300,000. The studies of stream pollution is developing with the installation of special laboratory facilities. These have included studies on the Neuse, the Haw, the Tar, the Catawba and the Roanoke.

This report would not be complete if it failed to contain expressions of appreciation for the whole-hearted and productive efforts given by Dr. John T. Burrus, President of the Medical Society of the State of North Carolina. His coöperation with the Board of Health in the furtherance of periodical health examinations and all other activities in which the Board is interested has been all that could be asked for. He, with representatives of the Board, has put this subject before physicians and citizens of nearly every county in the State. The subject has been received with pronounced interest and enthusiasm, and it is believed that the practice of periodical examinations is being rapidly expanded and emphatically appreciated, both by the profession and the citizenship of North Carolina.

The Secretary presented the following resolution for consideration, which upon motion by Doctor Wright, seconded by Doctor Crowell, was approved.

Whereas, the Congress of the United States has repealed Act Public 97, the same being an "Act for the Promotion of the Welfare of Maternity and Infancy and for Other Purposes;" and

Whereas, the appropriations made by Congress for distribution to the several states in accordance with said Act are discontinued effective June 30, 1929; and

Whereas, under the provisions of this Act North Carolina has been receiving annually the sum of \$27,259.66 to be expended by the North Carolina State Board of Health for the promotion of the welfare of maternity and infancy in this State:

THEREFORE BE IT RESOLVED by the North Carolina State Board of Health in session January 23, 1928, that the Senators and Representatives of North Carolina be respectfully urged to use their influence for the

reënactment of the said Act Public 97, generally known as the Sheppard-Towner Act, and for a continuance of the appropriations heretofore made under the provisions of the said Act.

The Secretary, for the information of the Board, read a communication from Doctor J. H. Harper of Greene County, with regard to a campaign for vaccination against smallpox now being conducted in that county.

Mr. Stowe called the Board's attention to a case near Charlotte in which one of the sanitary inspectors of the Board had exceeded his authority in ordering sanitary privies built at a rural filling station. In connection with the case Mr. Stowe stated that it was reported that two negro carpenters from Henderson, N. C., were following the inspector and endeavoring to secure work wherever the inspector might direct repairs or new construction, and that this led to the impression that there might be collusion between the inspector and these itinerant workmen. He urged that such practice be discouraged just as much as possible.

Nominations for President of the Board to fill the term of the late Dr. J. Howell Way, expiring in April, 1929, were called for, and the name of Dr. A. J. Crowell of Charlotte, was presented by Mr. Stowe, the nomination being seconded by Dr. Wright. There being no further nominations, upon vote Dr. Crowell was unanimously elected President of the Board for the term ending April, 1929.

Dr. Crowell briefly expressed his pleasure at the honor conferred upon him and pledged his best efforts to carry forward the work of the Board and to sustain the high standards set by Dr. Lewis, Dr. Way and Dr. Rankin. He suggested that each member of the Board should become responsible for particular feature of the Board's work, and asked that there be earnest coöperation by all.

The vacancies on the State Board of Embalmers created by the death of Dr. J. Howell Way and the resignation of Dr. Charles O'H. Laughinghouse were filled by the election of Dr. A. J. Crowell to fill the unexpired term of Dr. Way, and the election of Dr. D. A. Stanton to fill the unexpired term of Dr. Laughinghouse.

Mr. H. E. Miller presented for the consideration of the Board the Hoover Standard Plumbing Code as prepared by the Bureau of Standards of the United States Department of Commerce. Upon motion by Dr. Crowell, seconded by Dr. Wright, the Board approved this Code for recommendation to the municipalities of the State for adoption by them.

CHAPTER 1.—REGULATION OF PLUMBING

Definition of Plumbing

The "plumbing" of a building, as the term is commonly used, includes the pipes for distributing the water supply, the fixtures for using water, and drainage pipes for removing waste water and sewage, together with fittings and appurtenances of various kinds, all within or adjacent to the building. The "service pipe," which forms the connection between the water main and the building, and the "house sewer," which conveys the waste water and sewage from the building to the street sewer or other point of disposal, are included in the "plumbing system" of a building, using the term in a broader sense. Connections for rain water are also included if the water is discharged through a house sewer or a house

drain. The water supply and drainage system are mutually dependent. Drains are needed to carry away the used water; water is needed to cleanse the fixtures and transport solid wastes.

The work of the committee has emphasized the necessity of considering the plumbing system of buildings as intimately related to and forming an integral part of public water-supply and sewerage systems. The number and character of plumbing fixtures in a building are largely matters of individual choice, and owners have not sufficiently considered their relation to features of public service. Plumbing fixtures are the terminals of water-supply systems, and, to a large extent, control the quantity of water used. At the same time they are the beginnings of the sewerage system. The aggregate discharges from plumbing fixtures determine the flow in sewers and the volume of sewage reaching the outfall, this volume materially affecting the cost of any pumping or treatment of the sewage. It is evident, therefore, that the public interest may well justify a certain degree of governmental control over plumbing fixtures as affecting both the quantity of water available for public use and the economical operation of the sewerage system.

Relation of Plumbing to Health

An important function of the house-drainage system is to carry away from plumbing fixtures human excreta and wastes which may contain disease-producing bacteria. Because of the possible presence of such organisms sewage may be dangerous and must be disposed of in such a manner that there will be no chance of disease transmission. Sanitarians today place great emphasis on the importance of sewage treatment and safe methods of ultimate sewage disposal.

The leakage of polluted water from the house-drainage system is insanitary and dangerous. Leakage within the house may pollute the habitation and permit food infection through the medium of insects. Leakage in the ground outside the house may pollute water supplies taken from neighboring wells or find its way into or under the building. The maintenance of water seals between fixtures and drains and the permanent tightness of plumbing systems are important not only because they prevent the passage of air, but because they prevent the access of insects to the interior of the drains and sewers. If cockroaches, water bugs, and other vermin can pass from drains to food, they may transport disease germs, and thus be a bacteriological menace to health. It is therefore important that the drainage system be tight and without danger of leakage.

L. O. Howard, chief of the Bureau of Entomology of the United States Department of Agriculture, and C. W. Stiles, United States Public Health Service, in personal conversation with the chairman of the committee, are authority for the statement that insects can and do pass from the interior of leaking drainage systems to living quarters. Several other observers also report such occurrences.

Another danger to be guarded against is the use of fixtures in which the water supply and waste connections are so arranged that polluted waste water from the fixtures may, under certain circumstances, return into the water-supply pipes.

The line where the safe water supply ends and sewage begins is sometimes very finely drawn. If faucets with open spouts discharge over plumbing fixtures, and if there is a break between the water supply and the waste pipe, self-protection exists against possible pollution of the water-supply distributing system by the back flow of waste water into it. Plumbing fixtures such as water-closets, urinals, bidets, bathtubs, and lavatories with direct connections, secret wastes and overflows, and combination cocks offer possible sources of pollution.

The air in sewers and drains often contains gases resulting from the decomposition of excreta, soap, fats, and other wastes, together with gases from mineral oils which may come from garages, streets, and industrial establishments. Illuminating gas may also find its way into sewers through leakage. Among these gases may be found methane, sulphuretted hydrogen, and carbonic oxide. In large amounts those gases are poisonous to the human system, and there are physiological objections to breathing them even in small quantities. Hence, the air of sewers or drains should be kept from entering buildings intended for human habitation or occupancy by the use of proper plumbing installations and by suitable ventilation of the rooms or compartments in which the plumbing fixtures are located. The smell of these gases and other emanations from decomposing organic matter is naturally repugnant to human beings. It not only offends the sensibilities, but may produce shallow breathing, headache, and even nausea.

In addition to the above facts, it is important to consider the bacteriological aspects of sewer and drain air, a subject upon which there has been some misunderstanding. In recent years bacteriologists have made studies which have thrown light upon this subject. They have shown by experiment that while sewage often contains disease-producing bacteria derived from human excreta and body wastes these bacteria are rarely found in the air which escapes from sewers and drains. Hence, it has been argued by some that escaping sewer air has no influence on health. The committee does not agree with this conclusion. Health may be influenced by factors which do not cause specific diseases, for there are chemical and physiological as well as bacteriological factors involved. The investigations thus far made by bacteriologists should be considered to be merely a beginning of larger and more complete investigations which will doubtless be made as the science of bacteriology advances. The committee is of the opinion, therefore, that until further light on this somewhat obscure subject has been obtained the escape of sewer air from the house-drainage system, at frequent intervals or in considerable quantities, threatens the health of the building's occupants.

This whole matter has a quantitative as well as a qualitative aspect. The temporary losses of water seal in traps, which rarely occur and which are immediately replaced, do not involve any great danger to the health of the occupants, for in many cases the final drainage from the fixture will renew the seal within a short time, but where a loss of seal is likely to be of frequent occurrence and not readily replaced, or where breaks in the system admit sewer air continually to a building, the health of the occupants is subject to the dangers heretofore described.

Public Control of Plumbing Justifiable

For the above-mentioned reasons regulations governing the installation of plumbing have been established by law in many places. These regulations have been potent in improving living conditions throughout the country; in fact, they have even set the standards for those places where plumbing is not under public control. The knowledge now in possession of sanitarians in regard to the lessened bacteriological dangers of sewer air leads logically to some simplification in plumbing design, but it should not lead to an abandonment of practices necessary to protect buildings against the air of drains, which, in addition to its possible danger, is offensive to the smell.

The committee believes that good plumbing is a matter which concerns health. Government has the right to protect the people's health, but people also have rights, and plumbing regulations carried too far are unjust. Regulations which will not be supported by the courts fully and without question under a liberal interpretation of the police power may be regarded as unjust. Sanitary science, however, must be the guide to justice in this matter. The principles of science change as knowledge advances, and it is proper, therefore, that plumbing regulations be reviewed from time to time and, if necessary, revised.

Legal Principles

It is impossible to study the subject of plumbing regulation without having a proper conception of the common-law principle known as "police power," for, though a part of the common law and without absolutely definite limits, it can and must control court decisions, without which plumbing regulations would be futile. Attention should be called to the fact that this legal term "police power" does not mean the power of a policeman. It is true that the policeman, with his uniform and his stick, is one agency for enforcing the "police power," but plumbing inspectors, building inspectors, fire marshals, and health officers also act under the same "police power." Police power is that inherent power of government which protects the people against harmful acts of individuals, in so far as matters of safety, health, morals, or the like are concerned. "Police power" is "community power." Injuries against health come within the proper scope of the police power; but acts of government to enhance or promote health above normal, while laudable and often justifiable, do not fall within the scope of the police power.

There is a difference between conferring a benefit and preventing an injury, which, though difficult to define, is nevertheless real. Some of the requirements now generally included in plumbing codes represent a failure to make this distinction properly and can not be justified as essential to the protection of the public health from injury. When there is difficulty in enforcing such regulations and the cases are brought into court, it often happens that the code requirements are not supported. In this way well-meaning citizens comply with regulations which can not be enforced upon the unwilling citizen, and injustice results. Unfortunately, this situation exists today. Plumbing regulations, therefore, should be carefully examined in the light of modern sanitary science and accepted legal principles to determine their legality, keeping in mind that in so far as they protect the human health against injury they are justi-

fiable, but no farther. It should be observed also that legally the police power has to do with "health," not merely the "public health." This is a distinction which even a health officer often fails to make.

The following principles may be considered as safe guides in the matter of governmental control:

1. The control of plumbing by government is distinctly an act done under the police power, because it has to do with protection of the health of the people against injury, using this term in its broad and popular sense.

2. This use of the police power resides fundamentally in the State governments, but may be and often is delegated to cities, towns, or other subdivisions of states.

3. The police power has not been delegated to the Federal Government, except so far as needed to carry out certain delegated powers (as, for example, quarantine); hence, the Federal Government has only advisory powers regarding its employment by states.

4. The use of the police power in plumbing regulations is justified on the theory, supported by scientific evidence, that the passage of rats, cockroaches, water-bugs, and other vermin in and out of drains, or the escape of sewage or of air from drains or sewers into occupied human dwellings, are menaces to health, using this term in its broad and popular sense.

5. Plumbing regulations can not legally contain requirements which do not, either directly or indirectly, prevent injury to health, safety, morals, or the like. No requirements can legally be made which have to do merely with economies of construction, with benefits to the house owner or occupants, or with benefits to manufacturers, traders, or laborers, for the right and only legal use of the police power is to protect against injury.

6. The design of plumbing systems is properly within the scope of legal regulation in so far as it has to do with the escape of solids, liquids, or gases from, or the access of vermin and insects to drains and sewers, in such a way as to endanger health, and in so far as a safe and adequate supply of water to the fixtures is concerned.

7. Plumbing materials are properly subject to legal regulation in so far as their reliability in preventing dangers to health is concerned, looking ahead to a reasonable life of the building.

8. Methods of plumbing construction are properly subject to legal regulation in so far as they may be necessary to guard against danger to health through faulty workmanship.

9. The control of plumbing by the system of permit and inspection and test is a logical and apparently a satisfactory way of guarding against injury to health through faulty plumbing; but in view of different conditions existing in large and small communities the states should delegate to local communities the manner of administering this control.

10. The system of examining plumbers is for the public benefit and should be continued, but it might be better for the examining authorities to issue certificates of competency rather than "licenses."

11. The requirement that plumbing work, subject to permit and inspection, be done by licensed plumbers is justifiable under the police power.

12. Uniformity in methods of plumbing control is desirable, as it makes for convenience and economy. Uniformity can be secured by following models set up by Federal or State governments.

13. Standardization of plumbing designs, so far as dimensioning is concerned, standardization of plumbing materials, and even standardization of code requirements are for the public benefit, rather than for protection against injury, and should be brought about by agreement and concerted action. They can not be required legally under the police power.

14. As the police power resides in State governments and as uniformity in plumbing regulation is for the public benefit, it is well for all states to have simple, uniform, State-wide plumbing regulations alike in essential respects, limited to matters which properly come within the scope of the police power under a wide range of conditions, with provision for permitting local communities to regulate installation and inspection by such methods as they see fit to adopt. These may be appropriately called "basic plumbing principles."

15. The residence or dwelling is the basis for plumbing codes, because the majority of all buildings are of this type. A code applicable to dwellings is also applicable, although not necessarily sufficient, for other classes of buildings. Buildings differ as to plumbing conditions, so that different regulations for different classes of buildings are fully justified under the police power. In fact, to apply the same regulations to different conditions; that is, to require practices necessary in one case for another case where they are not necessary, is an improper use of the police power. The fourteenth amendment to the Constitution of the United States provides for "equal protection of the law," but equal protection means under like circumstances.

16. In addition to the basic plumbing principles, it is well for each State to adopt a code of plumbing rules conforming substantially to that hereinafter recommended, which has been so drawn that compliance therewith will practically assure compliance with the basic plumbing principles.

17. It is a well established principle in drawing specifications for works which involve operation that guaranteed results and detailed methods of construction should not both be specified at the same time. If certain guaranteed results are demanded, the contractor should be allowed some latitude in construction, and if detailed methods of construction are specified, it should be expected that the desired results will follow as a matter of course. Similarly, if reliance is placed on a general code of basic plumbing principles, there should obviously be freedom of choice as to many details; whereas if cities or towns choose to adopt a more rigid and detailed set of requirements compliance with them should be regarded as *prima facie* evidence that the desired results will be obtained.

CHAPTER 2.—PRESENT STATUS OF PLUMBING REGULATIONS

The committee has collected a large number of plumbing codes, State laws, and local ordinances and given them careful study. The situation may be described as chaotic.

Some states have no laws which regulate plumbing other than local enactments. A few states have mandatory plumbing laws state-wide in scope. Some have laws mandatory for cities of a certain size or for cities and towns having public water supplies. Others require cities to adopt ordinances regulating plumbing. Still others have permissive acts. There is an utter lack of uniformity in legal procedure governing these matters.

In the matter of administration some cities and some states require master plumbers and journeymen to be licensed, but some cities do not require licenses even though there are plumbing ordinances. The method of permit and inspection is almost universal, where there is any regulation at all, but sometimes the inspection is under a board of health, sometimes under a building department, occasionally under a special plumbing inspector, and, in a few instances, under a water department.

In the matter of codes the lack of uniformity is even greater. Some state codes are simple in their provisions; others set forth rules of plumbing practice in great detail. In many states the different cities have different codes. In one state there is a permissive state code, as well as many city codes resulting from local enactments.

Going further into detail, it is found that there are unaccountable differences in the regulations. Thus, in one State, where the whole subject of plumbing has recently been under investigation, some cities require the use of the running trap, other near-by cities prohibit its use, and some allow its use to be optional with the owner. Minor differences in regulations in different parts of the country may sometimes be justified on account of different climatic or local conditions, but the many radical differences found in the cities of a single state are unjustifiable.

Nearly all of the present plumbing codes are applied in their entirety to all of the buildings within the limits of their jurisdiction. Compiled originally for dwellings, they have been extended to other types of buildings, but proper discrimination has not always been made between high and low buildings, single or multiple, public or private, or between buildings used for different purposes. It is natural, perhaps, that codes should have developed in a rigid way, because the first code drawn was based on the requirements of a single city. Subsequent codes have been influenced by precedent, local pride, and selfish prejudice. Many codes have been established by copying other codes. Prejudice in favor of this or that method of construction has brought about unnecessary differences.

Supervision of Plumbing Inspection

There is frequently a lack of coördination between the different municipal departments which, in one way or another, are concerned with plumbing, namely, the departments of health, fire, water, sewers, buildings and streets. Under prevailing arrangements the owner or plumbing contractor must often obtain several permits from different city authorities and arrange for inspection by several men in order to comply fully with the regulations. For example, he may be obliged to go to the department of public works for permission to cut the pavement and for an inspector to see that the fill is properly made, to the city engineer for line and grade of the sewer, to the city engineer and health officer for permission to make connections with the sewer, to the division of water supply for permission to make water connection, and to the plumbing inspector for approval of his plumbing installation.

Conclusions Based on Scientific Procedure

Because of the irregularities and incongruities in plumbing codes the committee has not attempted to formulate minimum plumbing requirements by any method of selection or by any averaging process based on existing

codes. Instead, the committee has studied the entire problem anew and has based its conclusions for small buildings on legal principles and the applications of modern science, but has kept in mind existing conditions in order that suggested changes may not be great enough to cause serious inconvenience.

CHAPTER 3.—BASIC PLUMBING PRINCIPLES

The committee has given consideration to the formulation of a set of basic plumbing principles so general in scope and so fundamental in character as to be worthy of adoption by state, city, or town as a basis for its sanitary law. These have been drawn on the principle of specifying the results desired, making provision for testing the plumbing work to ascertain if the results are likely to be secured, but not attempting to specify details of construction.

These requirements are not regarded as sufficient for all cities, but the committee is of the opinion that states should adopt them on a state-wide mandatory basis or should give to cities, towns, or other subdivisions the power to choose between them and the more detailed plumbing code hereinafter recommended.

These principles were adopted by the committee early in its work as embodying the fundamental sanitary considerations which successful plumbing systems must satisfy. They have been utilized as a guide, both in directing the investigational work and in formulating recommendations.

In adopting these basic plumbing principles the committee has endeavored to keep in mind differences in climate in different parts of the country, differences in buildings, in methods of sewerage and sewage disposal, in disposal of rain water, and other differences. Some of the details of plumbing construction must vary with these conditions, but the basic sanitary principles are the same and the results desired and necessary to protect the health of the people are the same everywhere.

These principles are stated in the following pages. Explanations of the reasons for their adoption and of their application to conditions met with in practice are given in the notes in chapter 9. In making these explanatory notes the committee has given careful consideration to the questions raised by those who have reviewed the tentative report and has attempted to deal with the considerations naturally arising when the adoption of such basic principles is under discussion.

1. All premises intended for human habitation or occupancy shall be provided with a supply of pure and wholesome water.

2. Buildings in which water-closets and other plumbing fixtures exist shall be provided with a supply of water adequate in volume and pressure for flushing purposes.

3. The pipes conveying water to water-closets shall be of sufficient size to supply the water at a rate required for adequate flushing without unduly reducing the pressure at other fixtures.

4. Devices for heating water and storing it in "boilers," or hot-water tanks, shall be so designed and installed as to prevent all dangers from explosion and also prevent a back flow of hot water through a meter connected with a public water supply.

5. Every building intended for human habitation or occupancy on premises abutting on a street in which there is a public sewer shall have a connection with the sewer, and, if possible, a separate connection.

6. In multiple dwellings provided with a house drainage system there shall be for each family at least one private water-closet.

7. Plumbing fixtures shall be made of smooth nonabsorbent material, shall be free from concealed fouling surfaces, and shall be set free of inclosures.

8. The entire house drainage system shall be so designed, constructed, and maintained as to conduct the waste water or sewage quickly from the fixture to the place of disposal with velocities which will guard against fouling and the deposit of solids and will prevent clogging.

9. The drainage pipes shall be so designed and constructed as to be proof for a reasonable life of the building, against leakage of water or drain air due to defective materials, imperfect connections, corrosion, settlements or vibrations of the ground or building, temperature changes, freezing, or other causes.

10. The drainage system shall be provided with an adequate number of cleanouts so arranged that in case of stoppage the pipes may be readily accessible.

11. Each fixture or combination fixture shall be provided with a separate, accessible, self-scouring, reliable water-seal trap placed as near to the fixture as possible.

12. The house-drainage system shall be so designed that there will be an adequate circulation of air in all pipes and no danger of siphonage, aspiration, or forcing of trap seals under conditions of ordinary use.

13. The soil stack shall extend full size upward through the roof and have a free opening, the roof terminal being so located that there will be no danger of air passing from it to any window and no danger of clogging of the pipe by frost or by articles being thrown into it or of roof water draining into it.

14. The plumbing system shall be subjected to a water or air pressure test and to a final air pressure test in such a manner as to disclose all leaks and imperfections in the work.

15. No substances which will clog the pipes, produce explosive mixtures, or destroy the pipes or their joints shall be allowed to enter the house-drainage system.

16. Refrigerators, ice boxes, or receptacles for storing food shall not be connected directly with the drainage system.

17. No water-closet shall be located in a room or compartment which is not properly lighted and ventilated to the outer air.

18. If water-closets or other plumbing fixtures exist in buildings where there is no sewer within reasonable distance, suitable provision shall be made for disposing of the house sewage by some method of sewage treatment and disposal satisfactory to the health authority having jurisdiction.

19. Where a house-drainage system may be subjected to back-flow of sewage, suitable provision shall be made to prevent its overflow in the building.

20. Plumbing systems shall be maintained in a sanitary condition.

CHAPTER 4.—RECOMMENDED PLUMBING CODE FOR DWELLINGS AND SIMILAR BUILDINGS

As a result of its investigations the committee has drafted the following code of minimum requirements for the plumbing of dwellings and similar buildings.

Starting with the fundamental principle that plumbing regulations are applications of the police power in the interest of health, two ideas have been kept steadily in mind—simplification and standardization. Early studies showed the futility of attempting to bring about complete standardization by law. Apart from questionable legality was the insuperable difficulty of including in a code the innumerable items that would be necessary. The committee's attitude in regard to the subject of standardization is set forth in chapter 7. On the other hand, an attempt to simplify plumbing regulations by eliminating all items which are in the nature of specifications would reduce them practically to the list of basic principles given in chapter 3. The code recommended is a compromise between the two extreme ideas. It is shorter than some of the codes now being used, curtailments having been made in the interest of simplicity; it is longer than some, details having been included with a view to bringing to pass a certain amount of standardization. It is hoped that its requirements of design, coupled with its detailed structural requirements, will result not only in cheaper and better plumbing, but in a fairer and more uniform administration. A study of the recommended code will show that its length is due quite as much to its detailed classification as to its subject matter, brevity being sacrificed for the sake of clearness.

Attention should be called to the fact that the code, as presented, has been drawn primarily for dwelling houses, although most of its provisions apply to any sort of building. With slight modifications required to adapt it to local administrative conditions and with the addition, where necessary, of items applicable to buildings other than dwellings, the committee believes that its adoption by states and municipalities will tend to bring order out of the present chaos.

In Article III, which covers the subject of quality and weight of plumbing materials, references are made to standard specifications adopted by the American Society for Testing Materials, instead of writing these detailed requirements into the code, but for the information of persons studying this report the specifications referred to are given in Appendix D. In the case of lead pipe, no specifications have yet been adopted by the American Society for Testing Materials, and, therefore, detailed weights are inserted in the code. The idea of the committee is that codes adopted throughout the country shall require that plumbing materials conform to prevailing standards of good practice, and that an association of technical experts is better qualified to establish such standards and revise them as manufacturing arts progress than the state or municipal legislative authorities responsible for the plumbing code.

PLUMBING CODE FOR DWELLINGS AND SIMILAR BUILDINGS

Recommended by the Subcommittee on Plumbing of the Department
of Commerce Building Code Committee

Article I.—Definitions of Terms

[These recommendations apply only to dwellings and similar small buildings. The experimental work at the Bureau of Standards developed some additional information on installations for larger buildings, and this has been made available wherever possible throughout the report.]

SECTION 1. PLUMBING.—Plumbing is the art of installing in buildings the pipes, fixtures, and other apparatus for bringing in the water supply and removing liquid and water-carried wastes.

SEC. 2. PLUMBING SYSTEM.—The plumbing system of a building includes the water supply distributing pipes; the fixtures and fixture traps; the soil, waste, and vent pipes; the house drain and house sewer; the storm-water drainage; with their devices, appurtenances, and connections all within or adjacent to the building.

SEC. 3. WATER-SERVICE PIPE.—The water-service pipe is the pipe from the water main to the building served.

SEC. 4. WATER-DISTRIBUTION PIPES.—The water-distribution pipes are those which convey water from the service pipe to the plumbing fixtures.

SEC. 5. PLUMBING FIXTURES.—Plumbing fixtures are receptacles intended to receive and discharge water, liquid, or water-carried wastes into a drainage system with which they are connected.

SEC. 6. TRAP.—A trap is a fitting or device so constructed as to prevent the passage of air or gas through a pipe without materially affecting the flow of sewage or waste water through it.

SEC. 7. TRAP SEAL.—The trap seal is the vertical distance between the crown weir and the dip of the trap.

SEC. 8. VENT PIPE.—A vent pipe is any pipe provided to ventilate a house-drainage system and to prevent trap siphonage and back-pressure.

SEC. 9. LOCAL VENTILATING PIPE.—A local ventilating pipe is a pipe through which foul air is removed from a room or fixture.

SEC. 10. SOIL PIPE.—A soil pipe is any pipe which conveys the discharge of water-closets, with or without the discharges from other fixtures, to the house drain.

SEC. 11. WASTE PIPE AND SPECIAL WASTE.—A waste pipe is any pipe which receives the discharge of any fixture, except water-closets, and conveys the same to the house drain, soil, or waste stacks. When such pipe does not connect directly with a house drain or soil stack, it is termed a special waste.

SEC. 12. MAIN.—The main of any system of horizontal, vertical, or continuous piping is that part of such system which receives the wastes, vent or back vents, from fixture outlets or traps, direct or through branch pipes.

SEC. 13. BRANCH.—The branch of any system of piping is that part of the system which extends horizontally at a slight grade, with or without lateral or vertical extensions or vertical arms, from the main to receive fixture outlets not directly connected to the main.

SEC. 14. **STACK.**—Stack is a general term for any vertical line of soil, waste, or vent piping.

SEC. 15. **HOUSE DRAIN.**—The house drain is that part of the lowest horizontal piping of a house drainage system which receives the discharge from soil, waste, and other drainage pipes inside the walls of any building and conveys the same to the house sewer.

SEC. 16. **HOUSE SEWER.**—The house sewer is that part of the horizontal piping of a house drainage system extending from the house drain to its connection with the main sewer or cesspool and conveying the drainage of but one building site.

SEC. 17. **SIZE AND LENGTH.**—The given caliber or size of pipe is for a nominal internal diameter, except that other than iron pipe size, brass pipe is measured by its outside diameter. The developed length of a pipe is its length along the center line of pipe and fittings.

SEC. 18. **DEAD END.**—A dead end is a branch leading from a soil, waste, vent, house drain, or house sewer, which is terminated at a developed distance of two feet or more by means of a cap, plug, or other fitting not used for admitting water to the pipe.

Article II.—General Regulations

[These recommendations apply only to dwellings and similar small buildings. The experimental work at the Bureau of Standards developed some additional information on installations for larger buildings, and this has been made available wherever possible throughout the report.]

SEC. 19. **GRADES OF HORIZONTAL PIPING.**—All horizontal piping shall be run in practical alignment and at a uniform grade of not less than one-eighth of an inch per foot, and shall be supported or anchored at intervals not to exceed 10 feet. All stacks shall be supported at their bases, and all pipes shall be rigidly secured.

SEC. 20. **CHANGE IN DIRECTION.**—All changes in direction shall be made by the appropriate use of 45° wyes, half wyes, long sweep quarter bends, sixth, eighth, or sixteenth bends, except that single sanitary tees may be used on vertical stacks, and short quarter bends may be used in soil and waste lines where the change in direction of flow is from the horizontal to the vertical. Tees and crosses may be used in vent pipes.

SEC. 21. **PROHIBITED FITTINGS.**—No double hub, double T, or double sanitary T branch shall be used on soil or waste lines. The drilling and tapping of house drains, soil, waste, or vent pipes, and the use of saddle hubs and bands are prohibited.

SEC. 22. **DEAD ENDS.**—In the installation of any drainage system dead ends shall be avoided.

SEC. 23. **PROTECTION OF MATERIAL.**—All pipes passing under or through walls shall be protected from breakage. All pipes passing through or under cinder concrete or other corrosive material shall be protected against external corrosion.

SEC. 24. **WORKMANSHIP.**—Workmanship shall be of such character as fully to secure the results sought to be obtained in all of the sections of this code.

SEC. 25. **INSTALLATION OF PLUMBING BY OWNER.**—All plumbing installed by the owner shall comply with the requirements of this code and in such

event the word "owner" shall be substituted for the word "plumber" throughout this code.

Article III.—Quality and Weights of Materials

[These recommendations apply only to dwellings and similar small buildings. The experimental work at the Bureau of Standards developed some additional information on installations for larger buildings, and this has been made available wherever possible throughout the report.]

SEC. 26. MATERIALS, QUALITY OF.—All materials used in any drainage or plumbing system, or part thereof, shall be free from defects.

SEC. 27. LABEL, CAST OR STAMPED.—Each length of pipe, fitting, trap, fixture, and device used in a plumbing or drainage system shall be stamped or indelibly marked with the weight or quality thereof and the maker's mark or name.

SEC. 28. VITRIFIED CLAY PIPE.—All vitrified clay pipe shall conform to the A. S. T. M.¹ "Standard Specifications for Clay Sewer Pipe" (serial designation, C 13—20).

SEC. 29. CAST-IRON PIPE.—(a) *Quality*.—All cast-iron pipe and fittings shall conform to the A. S. T. M. "Standard Specifications for Cast-Iron Soil Pipe and Fittings" (serial designation, A 74—18).

(b) *Coating*.—All cast-iron pipe and fittings for underground use shall be coated with asphaltum or coal tar pitch.

SEC. 30. WROUGHT-IRON PIPE.—All wrought-iron pipe shall conform to the A. S. T. M. "Standard Specifications for Welded Wrought-Iron Pipe" (serial designation, A 72—21), and shall be galvanized.

SEC. 31. MILD-STEEL PIPE.—All steel pipe shall conform to the A. S. T. M. "Standard Specifications for Welded and Seamless Steel Pipe" (serial designation, A 53-21), and shall be galvanized.

SEC. 32. BRASS AND COPPER PIPE.—Brass and copper pipe shall conform, respectively, to the standard specifications of the A. S. T. M. for "Brass Pipe, Standard Sizes," and for "Copper Pipe, Standard Sizes," (serial numbers, B 43—23 and B 42—23, respectively).

SEC. 33. LEAD PIPE, DIAMETER, WEIGHTS.—All lead pipe shall be of best quality of drawn pipe, of not less weight per linear foot than shown below.

(a) Lead soil, waste, vent, or flush pipes, including bends and traps (extra light):

Inches	Internal Diameter	Weights per Ft.		Inches	Internal Diameter	Weights per Ft.	
		Lbs.	Ozs.			Lbs.	Ozs.
1	2	—	2	.....	4	—
1¼	2	8	3	.....	4	12
1½	3	8	4	.....	6	—

(b) Lead water-supply pipe above ground (strong):

Inches	Internal Diameter	Weights per Ft.		Inches	Internal Diameter	Weights per Ft.	
		Lbs.	Ozs.			Lbs.	Ozs.
½	2	—	1¼	.....	4	12
⅝	2	8	1½	.....	6	—
¾	3	—	1¾	.....	6	8
1	4	—	2	.....	7	—

¹American Society for Testing Materials.

(c) Lead water-supply pipe under ground (extra strong):

Internal Diameter		Weights per Ft.		Internal Diameter		Weights per Ft.	
Inches		Lbs.	Ozs.	Inches		Lbs.	Ozs.
1/2	-----	2	8	1 1/4	-----	6	---
5/8	-----	3	---	1 1/2	-----	7	8
3/4	-----	3	8	1 3/4	-----	8	---
1	-----	4	12	2	-----	9	---

SEC. 34. SHEET LEAD.—Sheet lead shall weigh not less than 4 pounds per square foot.

SEC. 35. SHEET COPPER OR BRASS.—Sheet copper or brass shall be not lighter than No. 18 B. and S. gauge, except that for local and interior ventilating pipe it shall be not lighter than No. 26 B. and S. gauge.

SEC. 36. GALVANIZED SHEET IRON.—Galvanized sheet iron shall be not lighter than the following B. and S. gauge:

No. 26 for 2- to 12-inch pipe.

No. 24 for 13- to 20-inch pipe.

No. 22 for 21- to 26-inch pipe.

SEC. 37. THREADED FITTINGS.—(a) Plain screwed fittings shall be of cast iron, malleable iron, or brass of standard weight and dimensions. (b) Drainage fittings shall be of cast iron, malleable iron, or brass, with smooth interior waterway, with threads tapped out of solid metal. (c) All cast iron fittings used for water-supply distribution shall be galvanized. (d) All malleable iron fittings shall be galvanized.

SEC. 38. CALKING FERRULES.—Brass calking ferrules shall be of the best quality red cast brass, with weights and dimensions in accordance with the following table:

Pipe Size (inches)	Actual Inside Diameter Inches	Length Inches	Weight Lbs. Ozs.	
2	2 1/4	4 1/2	1	---
3	3 1/4	4 1/2	1	12
4	4 1/4	4 1/2	2	8

SEC. 39. SOLDERING NIPPLES AND BUSHINGS.—(a) Soldering nipples shall be of brass pipe, iron-pipe, size, or of heavy, cast red brass not less than the following weights:

Diameters Inches	Weights Ozs.	Diameters Inches	Weights Lbs. Ozs.	
1 1/4	6	2 1/2	1	6
1 1/2	8	3	2	0
2	14	4	3	8

(b) Soldering bushings shall be of brass pipe, iron-pipe size, or of heavy, cast red brass.

SEC. 40. FLOOR FLANGES FOR WATER-CLOSETS.—Floor flanges for water-closets shall be not less than three-sixteenths of an inch thick, and of brass or cast iron.

Article IV.—Joints and Connections

[These recommendations apply only to dwellings and similar small buildings. The experimental work at the Bureau of Standards developed some additional information on installations for larger buildings, and this has been made available wherever possible throughout the report.]

SEC. 41. WATER AND AIR TIGHT JOINTS.—All joints and connections mentioned under this article shall be made permanently gas and water tight.

SEC. 42. VITRIFIED PIPE.—All joints in vitrified clay pipes, or between vitrified clay pipe and metals, shall be poured joints.

SEC. 43. CALKED JOINTS.—All calked joints shall be firmly packed with oakum or hemp, and shall be secured only with pure lead, not less than 1 inch deep, well calked, and no paint, varnish, or putty will be permitted until after the joint is tested.

SEC. 44. SCREW JOINTS.—All screw joints shall be American standard screw joints, and all burrs or cuttings shall be removed.

SEC. 45. CAST IRON.—Cast-iron joints may be either calked or screw joints made in the approved manner.

SEC. 46. WROUGHT IRON, STEEL, OR BRASS TO CAST IRON.—The joints may be either screwed or calked joints made in the approved manner.

SEC. 47. LEAD PIPE.—Joints in lead pipe or between lead pipe and brass or copper pipes, ferrules, soldering nipples, bushings, or traps, in all cases on the sewer side of the trap and in concealed joints on the inlet side of the trap, shall be full-wiped joints, with an exposed surface of the solder to each side of the joint of not less than three-quarters of an inch and a minimum thickness at the thickest part of the joint of not less than three-eighths of an inch.

SEC. 48. LEAD TO CAST IRON, STEEL, OR WROUGHT IRON.—The joints shall be made by means of a calking ferrule, soldering nipple, or bushing.

SEC. 49. SLIP JOINTS AND UNIONS.—Slip joints will be permitted only in trap seals or on the inlet side of the trap. Unions on the sewer side of the trap shall be ground faced, and shall not be concealed or inclosed.

SEC. 50. ROOF JOINTS.—The joint at the roof shall be made water-tight by use of copper, lead, or iron plates or flashings.

SEC. 51. CLOSET, PEDESTAL URINAL AND TRAP, STANDARD SLOP SINK, FLOOR CONNECTIONS.—A brass floor connection shall be wiped or soldered to lead pipe, an iron floor connection shall be calked to cast-iron pipe, or an iron floor connection calked or screwed to wrought-iron pipe, and the floor connection bolted to an earthenware trap flange. A metal to earthenware, a metal to metal union, or a lead or asbestos gasket or washer shall be used to make a tight joint.

SEC. 52. INCREASERS AND REDUCERS.—Where different sizes of pipes or pipes and fittings are to be connected, proper size increasers or reducers, pitched at an angle of 45° between the two sizes, shall be used.

SEC. 53. PROHIBITED JOINTS AND CONNECTIONS.—Any fitting or connection which has an enlargement, chamber, or recess with a ledge shoulder or reduction of the pipe area in the direction of the flow on the outlet or drain side of any trap is prohibited.

SEC. 54. EXPANSION BOLTS.—Connections of wall hangers, pipe supports, or fixture settings with the masonry, stone, or concrete backing shall be made with expansion bolts without the use of wooden plugs.

SEC. 55. NEW MATERIALS.—Any other material than that specified in this code, which the proper administrative authority approves as being equally efficient, may be permitted.

Article V.—Traps and Clean Outs

[These recommendations apply only to dwellings and similar small buildings. The experimental work at the Bureau of Standards developed some additional information on installations for larger buildings, and this has been made available wherever possible throughout the report.]

SEC. 56. TRAPS, KIND.—Every trap shall be self-cleaning. Traps for bathtubs, lavatories, sinks, and other similar fixtures shall be of lead, brass, cast iron, or of malleable iron, galvanized or porcelain enameled inside. Galvanized or porcelain enameled traps shall be extra heavy, and shall have a full bore smooth interior waterway, with threads tapped out of solid metal.

SEC. 57. TRAPS, PROHIBITED.—No form of trap which depends for its seal upon the action of movable parts or concealed interior partitions shall be used for fixtures.

SEC. 58. TRAPS, WHERE REQUIRED.—Each fixture shall be separately trapped by a water-seal trap placed as near to the fixture as possible, except that a set of not more than 3 laundry trays or lavatories or a set of 2 laundry trays and 1 sink may connect with a single trap, provided the trap is placed centrally and the branches connect into the trap seal at an angle of not more than 60° to the vertical arm. In no case shall the waste from a bathtub or other fixture discharge into a water-closet trap. No fixture shall be double trapped.

SEC. 59. WATER SEAL.—Each fixture trap shall have a water seal of not less than 2 inches and not more than 4 inches.

SEC. 60. TRAP CLEAN OUTS.—Each trap, except those in combination with fixtures in which the trap seal is plainly visible and accessible, shall be provided with an accessible brass trap screw of ample size, protected by the water seal.

SEC. 61. TRAP LEVELS AND PROTECTION.—All traps shall be set true with respect to their water seals and protected from frost and evaporation.

SEC. 62. PIPE CLEAN OUTS.—The bodies of clean-out ferrules shall be made of standard pipe sizes, conform in thickness to that required for pipe and fittings of the same metal, and extend not less than one-quarter inch above the hub. The clean-out cap or plug shall be of heavy red brass not less than one-eighth inch thick and be provided with raised nut or recessed socket for removal.

SEC. 63. PIPE CLEAN OUTS—WHERE REQUIRED.—A clean out easily accessible shall be provided at the foot of each vertical waste or soil stack. There shall be at least two clean outs in the house drain—one at or near the base of the stack and the other, with full-size Y branch, inside the wall near the connection between the house drain and house sewer. Except for the latter, clean outs shall be of the same nominal size as the pipes up to 4 inches and not less than 4 inches for larger pipes. The distance between clean outs in horizontal soil lines shall not exceed 50 feet.

SEC. 64. MANHOLES.—All underground traps and clean outs of a building, except where clean outs are flush with the floor, and all exterior underground traps shall be made accessible by manholes with proper covers.

SEC. 65. CLEAN OUTS—EQUIVALENTS.—Any floor or wall connection of fixture traps when bolted or screwed to the floor or wall shall be regarded as a clean out.

SEC. 66. GREASE TRAPS.—When a grease trap is installed, it shall be placed as near as possible to the fixture from which it receives the discharge and should have twice the capacity of the discharge.

SEC. 67. SAND TRAPS.—Sand traps when installed should be so designed and placed as to be readily accessible for cleaning.

SEC. 68. BASEMENT FLOOR DRAINS.—Cellar or basement floor drains shall connect into a trap so constructed that it can be readily cleaned and of a size to serve efficiently the purpose for which it is intended. The drain inlet shall be so located that it is at all times in full view. When subject to back flow or back pressure, such drains shall be equipped with an adequate back-water valve.

SEC. 69. BACK-WATER VALVES.—Back-water valves shall have all bearing parts or balls of noncorrodible metal and so constructed as to insure a positive mechanical seal and remain closed except when discharging wastes.

Article VI.—Water Supply and Distribution

[These recommendations apply only to dwellings and similar small buildings. The experimental work at the Bureau of Standards developed some additional information on installations for larger buildings, and this has been made available wherever possible throughout the report.]

SEC. 70. QUALITY OF WATER.—The quality of the water supply shall meet accepted standards of purity.

SEC. 71. DISTRIBUTION.—The water supply shall be distributed through a piping system entirely independent of any piping system conveying another water supply.

SEC. 72. WATER SERVICE.—The water-service pipe of any building shall be of sufficient size to permit a continuous ample flow of water on all floors at a given time.

SEC. 73. WATER SUPPLY TO FIXTURES.—All plumbing fixtures shall be provided with a sufficient supply of water for flushing to keep them in a sanitary condition. Every water-closet or pedestal urinal shall be flushed by means of an approved tank or flush valve of at least 4 gallons flushing capacity for water-closets and at least 2 gallons for urinals, and shall be adjusted to prevent the waste of water. The flush pipe for water-closet flush tanks shall be not less than 1¼ inches in diameter, and the water from flush tanks shall be used for no other purpose.

No water-closet or urinal bowl shall be supplied directly from a water-supply system through a flushometer or other valve unless such valve is set above the water-closet or urinal in a manner such as to prevent any possibility of polluting the water supply.

SEC. 74. SIZE OF WATER-SUPPLY PIPES.—The minimum size of water-service pipes from the curb to the dwelling shall be one-half inch, and to fixtures as follows:

	<i>Inch</i>		<i>Inch</i>
Sill cocks	½	Lavatories	¾
Hot water boilers	½	Bathtubs	½
Laundry trays	½	Water-closet tanks	¾
Sinks	½		

SEC. 75. WATER-SUPPLY CONTROL.—A main shut-off on the water-supply line shall be provided near the curb. Accessible shut-offs shall be provided on the main supply line just inside the foundation wall for each flat or

apartment of a building, for each lawn sprinkler, for supply to each hot water tank, and for each water-closet.

SEC. 76. WATER-SUPPLY PIPES AND FITTINGS—MATERIAL.—All water-supply pipes for a plumbing system shall be of lead, galvanized wrought-iron, or steel, brass, or cast iron, with brass or galvanized cast iron or galvanized malleable iron fittings. No pipe or fittings that have been used for other purposes shall be used for distributing water.

SEC. 77. WATER SUPPLY, PROTECTION.—All concealed water pipes, storage tanks, flushing cisterns, and all exposed pipes or tanks subject to freezing temperatures shall be efficiently protected against freezing.

SEC. 78. RELIEF VALVES.—Wherever a check valve is installed on the cold-water supply pipe between the street main and the hot-water tank there shall be installed on the hot-water distributing system a suitable relief valve.

SEC. 79. PUMPS AND HYDRANTS.—All pumps and hydrants shall be protected from surface water and contamination.

Article VII.—Plumbing Fixtures

[These recommendations apply only to dwellings and similar small buildings. The experimental work at the Bureau of Standards developed some additional information on installations for larger buildings, and this has been made available wherever possible throughout the report.]

SEC. 80. MATERIALS.—All receptacles used as water-closets, urinals, or otherwise for the disposal of human excreta, shall be vitrified earthenware, hard natural stone, or cast iron, white enameled on the inside.

SEC. 81. HOW INSTALLED.—All plumbing fixtures shall be installed free and open in a manner to afford access for cleaning. Where practical all pipes from fixtures shall be run to the wall, and no lead trap or pipe shall extend nearer to the floor than 12 inches unless protected by casing.

SEC. 82. WATER-CLOSET BOWLS.—Water-closet bowls and traps shall be made in one piece and of such form as to hold sufficient quantity of water, when filled to the trap overflow, to prevent fouling of surfaces, and shall be provided with integral flushing rims constructed so as to flush the entire interior of the bowl.

SEC. 83. FROST-PROOF CLOSETS—WHERE PERMITTED.—Frost-proof closets may be installed only in compartments which have no direct connection with a building used for human habitation or occupancy. The soil pipe between the hopper and the trap shall be 3 inches in diameter and shall be of lead, or cast iron enameled on the inside.

SEC. 84. FIXTURES PROHIBITED.—Fixed wooden wash trays or sinks shall not be installed in any building designed or used for human habitation. No new copper lined wooden bathtubs shall be installed, and an old fixture of this class taken out shall not be reconnected. Pan and valve plunger, offset washout and other water-closets having invisible seals or unventilated space, or walls not thoroughly washed at each flush shall not be used. Long hopper closets or similar appliances shall not hereafter be installed. No dry closet or chemical closet shall be installed in a dwelling.

SEC. 85. FLOOR DRAINS AND SHOWER DRAINS.—A floor drain or a shower drain shall be considered a fixture and provided with a strainer.

SEC. 86. **FIXTURE STRAINERS.**—All fixtures other than water-closets and pedestal urinals shall be provided with fixed strong metallic strainers with outlet areas not less than that of the interior of the trap and waste pipe.

SEC. 87. **FIXTURE OVERFLOW.**—The overflow pipe from a fixture shall be connected on the house or inlet side of the trap and be so arranged that it may be readily and effectively cleaned.

Article VIII.—Ventilation of Rooms and Fixtures

[These recommendations apply only to dwellings and similar small buildings. The experimental work at the Bureau of Standards developed some additional information on installations for larger buildings, and this has been made available wherever possible throughout the report.]

SEC. 88. **LOCATION OF FIXTURES.**—No trapped plumbing fixtures shall be located in any room or apartment which does not contain a window placed in an external wall or is not otherwise provided with proper ventilation.

SEC. 89. **VENTILATING PIPE, HOW CONNECTED.**—Ventilation pipes from fixtures and toilet rooms shall be separate and distinct and have no connection whatever with the other ventilating ducts or pipes in the building.

Article IX.—Soil, Waste, and Vent Pipes

[These recommendations apply only to dwellings and similar small buildings. The experimental work at the Bureau of Standards developed some additional information on installations for larger buildings, and this has been made available wherever possible throughout the report.]

SEC. 90. **MATERIAL.**—All main or branch soil, waste, and vent pipes within the building shall be of cast iron, galvanized steel or wrought iron, lead, brass, or copper, except that no galvanized steel or wrought iron pipe shall be used for underground soil or waste pipes.

SEC. 91. **FIXTURE UNIT.**—The following table based on the rate of discharge from a lavatory as the unit shall be employed to determine fixture equivalents:

	<i>Fixture Units</i>
One lavatory or wash basin.....	1
One kitchen sink	1½
One bathtub	2
One laundry tray	3
One combination fixture	3
One urinal	3
One shower bath	3
One floor drain	3
One slop sink	4
One water-closet	6

One hundred and eighty square feet of roof or drained area in horizontal projection shall count as one fixture unit.

SEC. 92. **SOIL AND WASTE STACKS.**—Every building in which plumbing fixtures are installed shall have a soil or waste stack, or stacks, extending full size through the roof. Soil and waste stacks shall be as direct as possible and free from sharp angles and turns. The required size of a soil or waste stack shall be independently determined by the total fixture units of all fixtures connected to the stack in accordance with the following tables:

WASTE STACKS

Number Fixture Units	Diameter of Stack Inches	Permitted Length Feet
1	1¼	45
2 to 8	1½	60
9 to 18	2	75
19 to 36	2½	105

SOIL AND WASTE STACKS

Number Fixture Units	Number of Water-Closets or Equivalent	Diameter of Stack Inches	Maximum Permitted Length Feet
37 to 72	1 to 12	3	150
73 to 300	13 to 50	4	225
301 to 720	51 to 120	5	300
721 to 1,080	121 to 180	6	400
1,081 to 1,920	181 to 320	8	600

Restrictions.—No water-closet shall discharge into a stack less than 3 inches in diameter. Not more than three water-closets or their equivalent in fixture units shall discharge into a 3-inch stack from one 3-inch branch, and not more than two such branches may connect to a 3-inch stack at the same point or level.

SEC. 93. SOIL AND WASTE STACKS, FIXTURE CONNECTIONS.—All soil and waste stacks and branches shall be provided with correctly faced inlets for fixture connections.

SEC. 94. CHANGING SOIL AND VENT PIPES.—In existing buildings where the soil or waste vent pipe is not extended undiminished through or above the roof, or where there is a sheet metal soil or waste vent pipe, and the fixture is changed in style or location or is replaced, a soil or waste vent pipe of the size and material prescribed for new work shall be installed.

SEC. 95. PROHIBITED CONNECTIONS.—No fixture connection shall be made to a lead bend or branch of a water-closet or similar fixture. No soil or waste vent, circuit or loop vent above the highest installed fixture on the branch or main shall thereafter be used as a soil or waste pipe.

SEC. 96. SOIL AND WASTE PIPE PROTECTED.—No soil or waste stack shall be installed or permitted outside a building unless adequate provision is made to protect it from frost.

SEC. 97. ROOF EXTENSIONS.—All roof extensions of soil and waste stacks shall be run full size at least 1 foot above the roof, and when the roof is used for other purposes than weather protection such extension shall not be less than 5 feet above the roof.

When there is danger of frost closure, no roof extension shall be less than 4 inches in diameter. Change in diameter shall be made by use of a long increaser at least 1 foot below the roof, and where access to the roof is difficult a test opening shall be provided at this point.

SEC. 98. TERMINALS.—The roof terminal of any stack or vent, if within 12 feet of any door, window, scuttle, or air shaft, shall extend at least 3 feet above the same.

SEC. 99. TERMINALS ADJOINING HIGH BUILDINGS.—No soil, waste or vent pipe extension of any new or existing building shall be run or placed on the outside of a wall, but shall be carried up in the inside of the roof.

In the event that a new building is built higher than an existing building, the owner of the new building shall not locate windows within 12 feet of any existing vent stack on the lower building unless the owner of such new building shall defray the expenses or shall himself make such alteration to conform with section 98 of this article.

It shall be the duty of the owner of the lower or existing building to make such alteration therein upon the receipt in advance of money or security therefor, sufficient for the purpose, from the owner of the new or higher building or to permit, at the election of the owner of the new or higher building, the making of such alteration by the owner of said new or higher building.

SEC. 100. TRAPS PROTECTED, VENTS.—Every fixture trap shall be protected against siphonage and back pressure, and air circulation assured by means of a soil or waste stack vent, a continuous waste or soil vent, or a loop or circuit vent. No crown vent shall be installed.

SEC. 101. DISTANCE OF VENT FROM TRAP SEAL.—No trap shall be placed more than 5 feet, horizontal developed length, from its vent. The distance shall be measured along the central line of the waste or soil pipe from the vertical inlet of the trap to the vent opening. The vent opening from the soil or waste pipe, except for water-closets and similar fixtures, shall not be below the dip of the trap.

SEC. 102. MAIN VENTS TO CONNECT AT BASE.—All main vents or vent stacks shall connect full size at their base to the main soil or waste pipe at or below the lowest fixture branch and shall extend undiminished in size above the roof or shall be reconnected with the main soil or waste vent at least 3 feet above the highest fixture branch.

SEC. 103. VENTS, REQUIRED SIZES.—The required size of main vents or vent stacks shall be determined on the basis of the size of the soil or waste stack, the number of fixtures or fixture units connected to the soil or waste stack, and the developed length of the main vent or vent stack in accordance with the following tables:

WASTE STACK

Diameter of Stack (Inches)	Fixture Units on Stack	Dimensions of Vent	
		Diameter Inches	Maximum Length Feet
1¼	1	1¼	45
1½	2-8	1¼	35
1½	2-8	1½	50
2	9-18	1¼	30
2	9-18	1½	60
2	9-18	2	75
2½	19-36	1¼	25
2½	19-36	1½	45
2½	19-36	2	60
2½	19-36	2½	105

SOIL OR WASTE STACK

Diameter of Stack (Inches)	Fixture Units on Stack	Water-Closets Only	Dimensions of Vent	
			Diameter Inches	Maximum Length Feet
3	6- 18	1- 3	1½	20
3	6- 18	1- 3	2	60
3	19- 42	4- 7	2	45
3	19- 42	4- 7	2½	¹ 150
3	43- 72	8- 12	2	30
3	43- 72	8- 12	2½	90
3	43- 72	8- 12	3	150
4	24- 42	4- 7	2	20
4	24- 42	4- 7	2½	45
4	24- 42	4- 7	3	100
4	43- 72	8- 12	2½	30
4	43- 72	8- 12	3	75
4	43- 72	8- 12	3½	150
4	43- 72	8- 12	4	300
4	73- 150	13- 25	3	60
4	73- 150	13- 25	3½	120
4	73- 150	13- 25	4	225
4	151- 300	26- 50	3	20
4	151- 300	26- 50	3½	50
4	151- 300	26- 50	4	100
4	151- 300	26- 50	5	¹ 225
5	301- 480	51- 80	2½	20
5	301- 480	51- 80	3	50
5	301- 480	51- 80	3½	100
5	301- 480	51- 80	4	175
5	301- 480	51- 80	5	¹ 300
5	481- 720	81-120	3½	25
5	481- 720	81-120	4	50
5	481- 720	81-120	5	125
5	481- 720	81-120	6	¹ 300
6	721- 840	121-140	3	20
6	721- 840	121-140	3½	40
6	721- 840	121-140	4	75
6	721- 840	121-140	5	225
6	721- 840	121-140	6	¹ 400
6	841-1,080	141-180	4	50
6	841-1,080	141-180	5	125
6	841-1,080	141-180	6	300
6	841-1,080	141-180	8	¹ 400
8	1,081-1,920	181-320	4	20
8	1,081-1,920	181-320	5	60
8	1,081-1,920	181-320	6	150
8	1,081-1,920	181-320	8	¹ 600

NOTE.—The capacities and vent stack requirements for 4- 5- 6- and 8-inch soil stacks are extrapolated from data obtained for 2- and 3-inch stacks with liberal added factors of safety to provide for all necessary elbows or changes in direction in the vent stack. They are believed to represent safe installations and closer approximations to actual requirements than any tables now available.

SEC. 104. BRANCH AND INDIVIDUAL VENTS.—No vents shall be less than 1¼ inches in diameter. For 1¼- and 1½-inch wastes the vent shall be of the same diameter as the waste pipe, and in no case shall a branch or main vent have a diameter less than one-half that of the soil or waste pipe served, and in no case shall the length of a branch vent of given diameter exceed the maximum length permitted for the main vent serving the same size soil or vent stack.

¹Limit in height of soil stack but not in length of vent if greater is required.

SEC. 105. VENT PIPE GRADES AND CONNECTIONS.—All vent and branch vent pipes shall be free from drops or sags and be so graded and connected as to drip back to the soil or waste pipe by gravity. Where vent pipes connect to a horizontal soil or waste pipe the vent branch shall be taken off above the center line of the pipe, and the vent pipe must rise vertically or at an angle of 45° to the vertical to a point 6 inches above the fixture it is venting before offsetting horizontally or connecting to the branch, main waste, or soil vent.

SEC. 106. CIRCUIT AND LOOP VENTS.—A circuit or loop vent will be permitted as follows: A branch soil or waste pipe to which two and not more than eight water-closets, pedestal urinals, trap standard slop sinks, or shower stalls are connected in the series may be vented by a circuit or loop vent, which shall be taken off in front of the last fixture connection. Where fixtures discharge above such branch, each branch shall be provided with a relief vent one-half the diameter of the soil or waste stack, taken off in front of the first fixture connection.

SEC. 107. VENTS NOT REQUIRED.—No vents will be required on a down spout or rain leader, trap, a back-water trap, a subsoil catch basin trap, or on a cellar floor drain, provided the cellar floor drain branches into the house drain on the sewer side at a distance of 5 feet or more from the base of the stack.

Where bathrooms or water-closets or other fixtures are located on opposite sides of a wall or partition or directly adjacent to each other within the prescribed distance, such fixtures may have a common soil or waste pipe and common vent.

Article X.—House Drains and Sewers

[These recommendations apply only to dwellings and similar small buildings. The experimental work at the Bureau of Standards developed some additional information on installations for larger buildings, and this has been made available wherever possible throughout the report.]

SEC. 108. INDEPENDENT SYSTEM.—The drainage and plumbing system of each new building and of new work installed in an existing building shall be separate from and independent of that of any other building, except as provided below, and every building shall have an independent connection with a public or private sewer when available.

Exception.—Where one building stands in the rear of another building on an interior lot and no private sewer is available or can be constructed to the rear building through adjoining alley, court, yard, or driveway, the house drain from the front building may be extended to the rear building and the whole will be considered as one house drain.

SEC. 109. OLD HOUSE SEWERS AND DRAINS.—Old house sewers and drains may be used in connection with new buildings or new plumbing only when they are found, on examination and test, to conform in all respects to the requirements governing new sewers or drains, as prescribed in this code. If the old work is found defective, the proper administrative authority shall notify the owner to make the necessary changes to conform with this code.

SEC. 110. CONNECTIONS WITH CESSPOOLS.—When a sewer is not available, drain pipes from buildings shall be connected with approved private sewage disposal works.

SEC. 111. EXCAVATIONS.—Each system of piping shall be laid in a separate trench, provided that drainage trenches may be benched not less than 18 inches for lighter piping, if not in violation of any city regulation prescribed for their installation. Where a double system of drainage is installed, the sanitary and surface house sewers or drains may be laid side by side in one trench.

Tunneling for distances not greater than 6 feet is permissible in yards, courts, or driveways of any building site. When pipes are driven, the drive pipe shall be at least one size larger than pipe to be laid.

All excavations required to be made for the installation of a house-drainage system, or any part thereof within the walls of a building, shall be open trench work. All such trenches and tunnels shall be kept open until the piping has been inspected, tested, and approved.

SEC. 112. HOUSE DRAINS UNDERGROUND.—Whenever possible all house drains shall be brought into the building below the basement or cellar floor.

SEC. 113. MATERIAL.—(a) The house sewer beginning 5 feet outside the building shall be of cast iron or of vitrified clay pipe; (b) the house drain when under ground shall be of lead, brass, or cast iron; (c) the house drain when above ground shall be of cast iron, galvanized wrought iron or steel, lead or brass, approved standards. (See Art. III, secs. 26 to 33, inclusive.)

SEC. 114. DEPTH OF DRAINS AND SEWERS.—No house sewer or underground house drain shall be laid parallel to or within 3 feet of any bearing wall, which might be thereby weakened. The house sewer and drains shall be laid at sufficient depth to protect them from frost.

SEC. 115. SIZE OF DRAINS AND SEWERS.—The required size of sanitary house drains and sanitary house sewers shall be determined on the basis of the total number of fixture units drained by them in accordance with the following table:

SANITARY SYSTEM ONLY

Fixture Units	SLOPE			No. Water-Closets or Equivalent
	1/8-inch to 1 foot	1/4-inch to 1 foot	1/2-inch to 1 foot	
6 to 12 diam. in inches	4	3	—	1-2
13 to 24 do	4	4	3	3-4
25 to 72 do	6	5	4	5-12
73 to 300 do	8	6	5	13-50
301 to 720 do	8	8	6	51-120
721 to 1,080 do	10	10	8	121-180
1,081 to 1,920 do	12	12	10	181-320

The required sizes of storm-water house drains and house sewers and other lateral storm drains shall be determined on the basis of the total drained area in horizontal projection in accordance with the following table:

SIZE OF HOUSE DRAIN AND SEWER FOR STORM-WATER ONLY

Number of Square Feet Drained Area		SLOPE		
		$\frac{1}{4}$ -inch to 1 foot	$\frac{1}{4}$ -inch to 1 foot	$\frac{1}{2}$ -inch to 1 foot
Up to 90	diam. in inches	1½	1½	1½
91 to 400	do	3	2	2
401 to 660	do	3	3	2
661 to 1,200	do	4	3	3
1,201 to 1,800	do	4	4	3
1,801 to 2,500	do	5	4	4
2,501 to 4,100	do	5	5	4
4,101 to 4,600	do	6	5	5
4,601 to 5,300	do	6	6	5
5,301 to 7,500	do	8	6	6
7,501 to 11,100	do	8	8	6
11,101 to 15,700	do	10	8	8
15,701 to 19,500	do	10	10	8
19,501 to 24,800	do	12	10	8
24,801 to 31,000	do	12	12	10
31,001 to 44,000	do	14	12	10
44,001 to 60,000	do	14	14	12

SEC. 116. COMBINED STORM AND SANITARY SEWER SYSTEMS.—Whenever a combined sewer system is employed, the required size of the house sewer shall be determined by adding to the drained area in square feet 180 square feet for each “fixture unit” on the sanitary system (see table, sec. 91) and then applying the total to the preceding table for storm sewers, except that no combined sanitary and storm sewer shall be less than 4 inches in diameter. The required sizes of the sanitary house drain and the storm house drain up to their point of junction may be independently determined from the table.

SEC. 117. HOUSE SEWER IN MADE GROUND.—The house sewer when laid in made or filled-in ground shall be of vitrified clay pipe, laid on bed of approved grillage or concrete, or of cast iron pipe, A. S. T. M. approved standards.

SEC. 118. DRAINAGE BELOW SEWER LEVEL.—In all buildings in which the whole or part of the house drainage and plumbing system thereof lies below the crown level of the main sewer, sewage or house wastes shall be lifted by approved artificial means and discharged into the house sewer.

SEC. 119. SUMPS AND RECEIVING TANKS.—All subhouse drains shall discharge into an air-tight sump or receiving tank so located as to receive the sewage by gravity, from which sump or receiving tank the sewage shall be lifted and discharged into the house sewer by pumps, ejectors, or any equally efficient method. Such sumps shall be either automatically discharged or be of sufficient capacity to receive the house sewage and wastes for not less than 24 hours.

SEC. 120. EJECTORS, VENTED.—The soil or vent pipe leading to an ejector or other appliance for raising sewage or other waste matter to the street sewer shall, where a water-closet or closets are installed, be provided with a vent pipe not less than 4 inches in diameter, and where fixtures other than water-closets are installed the waste vent pipe shall be the same diameter as the waste pipe.

SEC. 121. MOTORS, COMPRESSORS, ETC.—All motors, air compressors, and air tanks shall be located where they are open for inspection and repair

at all times. The air tanks shall be so proportioned as to be of equal cubical capacity to the ejectors connected therewith in which there shall be maintained an air pressure of not less than 2 pounds for each foot of height the sewage is to be raised.

SEC. 122. EJECTORS FOR SUBSOIL DRAINAGE.—When subsoil catch basins are installed below the sewer level, automatic water ejectors provided with a ball float attached to the main water supply shall be used. Such ejectors or any device raising subsoil water shall discharge into a properly trapped fixture or into a storm-water drain.

Article XI.—Storm-Water Drains

[These recommendations apply only to dwellings and similar small buildings. The experimental work at the Bureau of Standards developed some additional information on installations for larger buildings, and this has been made available wherever possible throughout the report.]

SEC. 123. DRAINAGE OF YARDS, AREAS, AND ROOFS.—All roofs and paved areas, yards, courts, and courtyards shall be drained into the storm-water sewerage system or the combined sewerage systems, but not into sewers intended for sewage only. When drains used for this purpose are connected with the combined sewerage systems, they shall be effectually trapped, except roof leaders and conductors, where the roof or gutter opening is located not less than 12 feet from a door, window scuttle, or air shaft. One trap may serve for all such connections, but traps must be set below the frost line or on the inside of the building. Where there is no sewer accessible, such connections shall be discharged into the public gutter, unless otherwise permitted by the proper authorities, and in such case need not be trapped.

SEC. 124. SIZE OF GUTTERS AND LEADERS.—No gutter or inside leader shall be of less size than the following:

Area of Roof (in square feet)	Gutter <i>Inches</i>	Leader <i>Inches</i>
Up to 90	3	1½
91 to 270	4	2
271 to 810	4	2½
811 to 1,800	5	3
1,801 to 3,600	6	4
3,601 to 5,500	8	5
5,501 to 9,600	10	6

Outside leaders to the frost line shall be one size larger than required in the above table.

Gutters 8 inches or over in width on new buildings shall be hung with wrought-iron hangers of approved type.

The above sizes of rain leaders are based on diameter of circular rain leaders, and gutters based on semi-circular sheet-metal gutters with the top dimension given and other shapes shall have the same sectional area.

SEC. 125. INSIDE CONDUCTORS.—When placed within the walls of any building or run in an inner or interior court or ventilating pipe shaft, all conductors or roof leaders shall be constructed of cast iron or of galvanized wrought iron or steel pipe.

SEC. 126. OUTSIDE CONDUCTORS.—When outside conductors or down spouts of sheet metal are connected with the house drain, they shall be

so connected by means of not less than one length of cast-iron pipe extending vertically at least 1 foot above the grade line.

Along public driveways without sidewalks they shall be placed in niches in the walls, protected by wheel guards, or enter the building through the wall at a 45° slope at least 12 feet above the grade.

SEC. 127. DEFECTIVE CONDUCTOR PIPES.—When an existing sheet-metal conductor pipe within the walls of any building becomes defective, such conductor shall be replaced by one which conforms to this code.

SEC. 128. VENT CONNECTIONS WITH CONDUCTORS PROHIBITED.—Conductor pipes shall not be used as soil, waste, or vent pipes, nor shall any soil, waste, or vent pipes be used as conductors.

SEC. 129. OVERFLOW.—Overflow pipes from cisterns, supply tanks, expansion tanks, and drip pans shall connect only indirectly with any house sewer, house drain, soil, waste, or vent pipe.

SEC. 130. SUBSOIL, FOUNDATION, CLEAR WATER, AND ABSORPTION TILE DRAINS.—Where subsoil drains are placed under the cellar floor or used to encircle the outer walls of a building, the same shall be made of open-jointed drain tile or earthenware pipe, not less than 4 inches in diameter, and shall be properly trapped and protected against back pressure by an automatic back-pressure valve accessibly located before entering the house sewer or drain. They may discharge through a cellar drain.

SEC. 131. SUBSOIL DRAINS BELOW SEWER LEVEL.—Subsoil drains below the main sewer level shall discharge into a sump or receiving tank, the contents of which shall be automatically lifted and discharged into the drainage system above the cellar through some properly trapped fixture or drain.

Article XII.—Refrigerator, Safe, and Special Wastes

[These recommendations apply only to dwellings and similar small buildings. The experimental work at the Bureau of Standards developed some additional information on installations for larger buildings, and this has been made available wherever possible throughout the report.]

SEC. 132. FIXTURES PERMITTED TO CONNECT.—No waste pipe from a refrigerator or ice box floor drain, or any other receptacle where food is stored shall connect directly with any house drain, soil, or waste pipe. Such waste pipes shall in all cases empty into an open sink that is properly supplied with water, connected, trapped, and vented, the same as other fixtures, or they may discharge into a down spout or rain leader trap located inside the building or into a cellar floor drain, but their ends must be left open. Such waste connections shall not be located in inaccessible or unventilated cellars.

SEC. 133. REFRIGERATOR WASTES.—Refrigerator-waste pipes shall be not less than 1¼ inches for one opening, 1½ inches for three openings, and for four to 12 openings must be not less than 2 inches, and shall have at each opening a trap, and clean-out at angles, so arranged as properly to flush and clean pipe. Such waste pipes shall be continued not less than full size through the roof, except where such fixtures are located in the basement or first floor.

SEC. 134. OVERFLOW PIPES AND MOTOR EXHAUSTS.—Pipes from a water-supply tank or exhaust from a water lift shall not be directly connected

with any house drain, soil, or waste pipe. Such pipe shall discharge upon the roof or be trapped into an open fixture or discharge as for refrigerator wastes.

Article XIII.—Maintenance

[These recommendations apply only to dwellings and similar small buildings. The experimental work at the Bureau of Standards developed some additional information on installations for larger buildings, and this has been made available wherever possible throughout the report.]

SEC. 135. DEFECTIVE FIXTURES.—All installed fixtures found defective or in an insanitary condition shall be repaired, renovated, replaced, or removed within 30 days upon written notice from the proper administrative authorities.

SEC. 136. TEMPORARY TOILET FACILITIES.—Suitable toilet facilities shall be provided for the use of workmen during the construction of any building. These toilet facilities shall be maintained in a sanitary condition.

Article XIV.—Inspections and Tests

[These recommendations apply only to dwellings and similar small buildings. The experimental work at the Bureau of Standards developed some additional information on installations for larger buildings, and this has been made available wherever possible throughout the report.]

SEC. 137. INSPECTIONS.—All piping, traps, and fixtures of a plumbing system shall be inspected by the proper administrative authority to insure compliance with all the requirements of this code and the installation and construction of the system in accordance with the approved plans and the permit.

SEC. 138. NOTIFICATION.—(a) It shall be the duty of the plumber to notify the proper administrative authority and the owner, or his authorized agent orally, by telephone, or in writing, not less than eight working hours between the hours of 8 A.M. and 4 P.M. before the work is to be inspected or tested.

(b) It shall be the duty of the plumber to make sure that the work will stand the test prescribed before giving the above notification.

(c) If the proper administrative authority finds that the work will not stand the test, the plumber shall be required to renotify as above and to pay the sum of _____ dollars for each renotification.

(d) If the proper administrative authority fails to appear within 24 hours of the time set for each inspection or test, the inspection or test shall be deemed to have been made, and the plumber required to file an affidavit with the proper administrative authority that the work was installed in accordance with the code, the approved plans and permit, and that it was free from defects and that the required tests had been made and the system found free from leaks; also whether the owner or his authorized agent was present when such inspection or test was made, or was duly notified.

(e) At the time the permit is taken out a written waiver by the owner of notification may be filed with the proper administrative authority.

SEC. 139. MATERIAL AND LABOR FOR TESTS.—The equipment, material, power, and labor necessary for the inspection and test shall be furnished by the plumber.

SEC. 140. SYSTEM TESTS.—All the piping of a plumbing system shall be tested with water or air. After the plumbing fixtures have been set and their traps filled with water the entire drainage system shall be submitted to a final air-pressure test. The proper administrative authority may require the removal of any clean-outs to ascertain if the pressure has reached all parts of the system.

SEC. 141. METHODS OF TESTING.—(a) *Water test*.—The water test may be applied to the drainage system in its entirety or in sections. If applied to the entire system, all openings in the piping shall be tightly closed, except the highest opening above the roof and the system filled with water to the point of overflow above the roof.

If the system is tested in sections, each opening shall be tightly plugged, except the highest opening of the section under test, and each section shall be filled with water; but no section shall be tested with less than a 10-foot head of water or a 5-pound pressure of air. In testing successive sections at least the upper 10 feet of the next preceding section shall be retested, so that no joint or pipe in the building shall have been submitted to a test of less than a 10-foot head of water or a 5-pound pressure of air.

Under any test the water or air pressure shall remain constant for not less than 15 minutes without any further addition of water or air.

(b) *Air test*.—The air test shall be made by attaching the air compressor or test apparatus to any suitable opening and closing all other inlets and outlets to the system, then forcing air into the system until there is a uniform pressure sufficient to balance a column of mercury 10 inches in height or 5 pounds per square inch on the entire system. This pressure shall be maintained for 15 minutes.

(c) *Final air test*.—The air machine shall be connected to any suitable opening or outlet and an air pressure equivalent to 1-inch water column shall be applied and left standing at least 15 minutes. If there is no leakage or forcing of trap seals indicated by the fluctuation of the drum, float, or water column, the system shall be deemed air-tight.

SEC. 142. ORDER OF TESTS.—The tests may be made separately, as follows:

(a) The house sewer and all its branches from the property line to the house drain.

(b) The house drain and yard drains, including all piping to the height of 10 feet above the highest point on the house drain, except the exposed connections to fixtures.

(c) The soil, waste, vent, inside, conductor, and drainage pipes which would be covered up before the building is inclosed or ready for completion. The tests required for (b) and (c) may be combined.

(d) The final test of the whole system.

(e) After each of the above tests has been made and proved acceptable the proper administrative authority shall issue a written approval.

SEC. 143. COVERING OF WORK.—No drainage or plumbing system or part thereof shall be covered until it has been inspected, tested, and approved as herein prescribed.

SEC. 144. UNCOVERING OF WORK.—If any house drainage or plumbing system or part thereof is covered before being regularly inspected, tested,

and approved, as herein prescribed, it shall be uncovered upon the direction of the proper administrative authority.

SEC. 145. DEFECTIVE WORK.—If inspection or test shows defects, such defective work or material shall be replaced within three days and inspection and test repeated.

SEC. 146. HOUSE SEWER AND HOUSE DRAIN TESTS.—The house sewer and house drain shall be tested with water or air. The water test shall have not less than a 10-foot head of water and the air test not less than a 5-pound pressure. All alterations, repairs, or extensions, which shall include more than 10 feet, shall be inspected and tested.

SEC. 147. CONDUCTOR PIPES.—Conductor pipes and their roof connections within the walls of buildings, or conductor branches on the outside system where such branches connect with the house drain or are less than 3 feet from the wall of the building, shall be tested by the water or air test. Conductor branches on the outside system may be tested in connection with the house drain.

SEC. 148. STABLE AND STABLE-YARD DRAIN TEST.—If a stable or any part of a stable be used for human habitation, the same inspections and tests of plumbing and drainage systems thereof shall be made as in the case of an ordinary dwelling. Otherwise, all stable and stable-yard drains shall be inspected, but need not be tested.

SEC. 149. GARAGE AND DRAINAGE SYSTEM.—For a garage or any part of a garage the same tests and inspection of the plumbing and drainage system thereof shall be made as in the case of an ordinary dwelling.

SEC. 150. TEST OF WATER-DISTRIBUTION SYSTEM.—Upon the completion of the entire water-distribution system it shall be tested and proved tight under a water pressure not less than the maximum working pressure under which it is to be used.

SEC. 151. CERTIFICATE OF APPROVAL.—Upon the satisfactory completion and final test of the plumbing system a certificate of approval shall be issued by the proper administrative authority to the plumber to be delivered to the owner.

SEC. 152. AIR TEST OF DEFECTIVE PLUMBING.—The air test shall be used in testing the sanitary condition of the drainage or plumbing system of all buildings where there is reason to believe that it has become defective. In buildings condemned by the proper administrative authority because of insanitary conditions of the plumbing system the alterations in such system shall not be considered as repairs, but as new plumbing.

SEC. 153. INSPECTIONS AND TESTS NOT REQUIRED.—No tests or inspections shall be required where a plumbing system or part thereof is set up for exhibition purposes and is not used for toilet purposes and not directly connected to a sewerage system; nor after the repairing or replacing of an old fixture, faucet, or valve by a new one (to be used for the same purpose); nor after forcing out stoppages and repairing leaks.

Mr. H. E. Miller presented the following report on special phases of the work of the Bureau of Sanitary Engineering and Inspection:

REPORT OF DEVELOPMENTS IN SEWAGE AND INDUSTRIAL WASTE STUDY AND CONTROL MEASURES

At the request of Dr. Bishop, the State Health Officer of Tennessee, a conference was held with Mr. Reuben Robertson, President and General Manager of the Champion Fibre Company, relative to possible measures for correction of the pollution of the Pigeon river, in the interest of protecting water supplies of Tennessee. This conference was held at Canton on August 10th, and was attended by Dr. Bishop, the Chief Engineer of the Tennessee State Department of Health, the District Engineer of the United States Public Service, Dr. Laughinghouse, and myself.

A policy of protection of equitable rights to a fair use of the stream for waste disposal and the prevention of excessive pollution of the stream for water supply purposes was stated for the North Carolina State Board of Health. Furthermore a desire to cooperate with this and other industries in the solution of waste disposal problems and the establishment of reasonable corrective measures was stated by your representatives present.

These assurances opened the way for an approach of this problem, unhampered by any resistance which might have been contemplated by the industry.

In searching for information and precedents of other states dealing with similar problems, it was found that Pennsylvania had made material progress in solution of the pulp and paper waste problem by cooperative study under an agreement with the industry, and was making progress in a similar manner with the tannery industry.

Since this matter came up while an approach of the textile and other industrial waste problems was under consideration, it was decided to call together representatives of all industries to a conference to determine their attitude toward cooperation with the State and shouldering a part of the burden of the study of corrective measures.

Since there had been complaints lodged with the Conservation Commission relative to the effects of industrial wastes on fish life, chief of which were a taste imported to shad in Tar River from Rocky Mount Gas Plant wastes, the killing of fish in the Haw River above Burlington, by a combination of textile and fertilizer wastes, the destruction of the Rock Fishing Industry at Weldon allegedly because of paper mill wastes in the Roanoke River, it became apparent that conflict in the interests and activities of the two departments might easily arise. Therefore, after visiting the Pennsylvania State Department of Health and studying the plan of organization and functioning of that department with four other departments having stream regulation, and operating in group action, known as the Sanitary Water Board, for which the Department of Health is the functioning agent, a conference was held with representatives of the Conservation Department, and a working agreement developed. A committee consisting of the State Health Officer as chairman, the Conservation Commissioner as recording secretary, and the Chief Engineers of the two departments was formed, by whom all stream pollution problems are to be considered to avoid overlapping and conflict. In this plan this department conducts all sanitary investigations for whatever purpose, and the Conservation Department conducts all stream flow and measurements studies for whatever purpose. Accordingly the conference with industrial representatives was called in the name of the committee representing the two departments. The meeting was held at the same time and place of the State Water Works Convention in Durham, November 8th, and was addressed by Mr. Stevenson, Chief Engineer of the Pennsylvania State Department of Health, Mr. Waring, Chief Engineer of the Ohio State Department of Health, Mr. Jobson, representing the New York-Pennsylvania Pulp and Paper Company of Lock Haven, Pa., and Mr. Jones, Chief Counsel of the Elk Tanning Company of Ridgeway, Pa., all of whom bespoke the cooperation of industry with the State based upon their experience representing both the State and the industries. This marvelous cooperation was due to the courtesy of Dr. Apple, State Health Commissioner of Pennsylvania, and the interest and energy of Mr. Stevenson.

Without exception these representatives of the industries present, including Mr. Cone of the Proximity Manufacturing Co., Mr. Lewis of the Erwin Cotton Mills and representing Mr. Bahnson, President State Industrial Council, Mr. Cramer of the Cramerton Manufacturing Co., Mr. Fessenden of Sayles Bleacheries, and Mr. Robert Spurr Weston, Consulting Engineer of Boston, representing the Sayles Co., Mr. Kjelderer, representing the International Shoe Company with tanneries at Morganton and North Wilkesboro also representing Mr. E. L. McKee, President of the Western North Carolina Manufacturers' Association, Mr. Weaver and three other officials of Marshall Fields Cotton and Woolen Mills, and Mr. Bryant of the Cannon Manufacturing Company, expressed themselves as highly pleased with the conference and appreciation of the attitude of the State.

This conference, in my opinion, has never been paralleled in the history of this or any other State and is of immeasurable significance for constructive progress in this State.

At our suggestion, a committee of the Textile Manufacturers' Association has been appointed to cooperate with us in the development of plans for cooperative attack of the textile waste problem. This committee consists of Mr. Bernard Cone, Mr. Lewis of the Erwin Mills, and Mr. Stuart Cramer, Jr.

In the interest of forming affiliations for securing valuable information and aid, application was made to the group of states included in the Ohio River Basin which have formed into an agreement for the sanitary protection of the waterways of the Ohio River Basin. Through this agreement a board of engineers, composed of the chief engineers of the State Departments of Health, partly to the agreement has been formed. Your engineer was invited to the meeting of this board held at Louisville, December 2nd and 3rd. At this meeting it was agreed that confidential exchange of preliminary data in sewage and waste disposal would be made between states of the agreement. This makes all such information now possessed or that may be developed by New York, Pennsylvania, Ohio, West Virginia, Indiana, Illinois, Maryland, Kentucky, Tennessee, and Virginia available to the North Carolina State Board of Health. This enhances the progress of North Carolina many years in the course of time and will effect a tremendous saving in cost of investigations.

At the invitation of the Pennsylvania State Department of Health and the Pulp and Paper Research Committee of Pennsylvania, your engineer and Mr. Waring, chief engineer of the Ohio State Department of Health, were invited to attend the committee's meeting held at Harrisburg, Pa., December 16th. The guests were invited to take part in review of the work of eight different industrial plant laboratories and the State Department of Health sewage and waste laboratory before the committee, and were given all data developed up to that time. The committee made your engineer an associate member of the committee and agreed to make one pulp and paper company of North Carolina associate member. This gives us the same advantage as so many laboratories and scientists in our own State working on the problem. We are, of course, expected to contribute our share of investigation.

We now have an intensive investigation of paper mill wastes in the Roanoke River under way, in connection with determining the effect of these wastes on fish life and upon the Weldon water supply, with intake located one mile below the paper mill. We have the whole-hearted cooperation of the industry in this case as has been universally accorded elsewhere to the State Board of Health and the department's unbroken policy of cooperation and common sense.

The Secretary informed the Board that through the courtesy of the International Health Board financial assistance had been obtained for the Secretary and Dr. C. N. Sisk, director of County Health Work, to visit the states of Georgia, Alabama, Tennessee and Ohio for the purpose of observation and study of methods of county health development in those states.

Upon motion of Dr. Crowell, seconded by Dr. Stanton, a committee composed of Dr. Thompson and Dr. Laughinghouse was appointed to draft

suitable resolutions of respect for Dr. J. Howell Way, the same to be spread upon the minutes of the Board and copies sent to the members of the family of Dr. Way.

Whereas, it is generally conceded that J. Howell Way has for many years occupied the position of a most outstanding and noteworthy physician and citizen of North Carolina, and

Whereas, his services to the profession are evidenced by his having played a most constructive part in all those things which make it cleaner, finer and more universally useful, and

Whereas, his services to the Board of Health from 1905 up to the time of his death evidenced a splendid consciousness of his trust and an outstanding capacity for discharging it, and

Whereas, he caught the vision of the progressive idealism that was in the heart and mind of the beloved Lewis and gave his life to carrying it on, and

Whereas, he wore the mantle of President in such a way as to bring gratification, appreciation and pride to him who made that mantle verily a robe of royal purple; now

THEREFORE BE IT RESOLVED, that in the passing of its distinguished and beloved President, the North Carolina Board of Health hereby records respect, confidence, admiration and affection for him and expresses in this record genuine sorrow because of its realization of having sustained irreparable loss both to itself and to the State.

Upon motion of Dr. Wright, the Board adjourned after accepting his invitation to be his guests at the weekly luncheon meeting of the Raleigh Rotary Club.

CHAS. O'H. LAUGHINGHOUSE,
Secretary.

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